



April 26, 2003

Mr. Steve Trent Fluor Hanford Inc. 825 Jadwin Avenue Richland, WA 99352

Reference:

P.O. #630

Eberline Services R3-03-053-7453, SDG(H2098

Dear Mr. Trent:

Enclosed is the data report for one solid sample designated under SAF No. F03-003 received at Eberline Services on March 13, 2003. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion

Melin Mamm

**Program Manager** 

MCM

Enclosure: Data Package

**EDMC** 

Page 1 of 2

#### 1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2098 was composed of one solid (soil) sample designated under SAF No. F03-003 with a Project Designations of: 200 Area Source Characterization 200-CS-1 OU – Soil Sampling. The sample in SDG H2098 (Group R303053-7453) was batched with the samples in SDG H2093 (Group R303039-7451).

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

#### 2.0 ANALYSIS NOTES

## 2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

### 2.2 Tritium Analyses

The H-3 matrix spike recovery was 87%. The matrix spike is associated with a sample in SDG H2093 (Group R303039-7451). No problems were encountered during the course of the analyses.

## 2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

## 2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

### 2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

#### 2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

## 2.7 Isotopic Uranium Analyses

Per FHI's instructions, the sample in SDG H2098 was not analyzed for isotopic uranium (see attached e-mail dated April 15, 2003).

#### 2.8 Total Uranium Analyses

No problems were encountered during the course of the analyses.

**Case Narrative** 

Page 2 of 2

#### 2.9 Neptunium-237 Analyses

The LCS percent recovery (75%) was below the laboratory protocol limits (80 to 120%), but within the FHI contract limits (70 to 130%). No other problems were encountered during the course of the analyses.

#### 2.10 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

#### 2.11 Americium-241 Analyses

No problems were encountered during the course of the analyses.

#### 2.12 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

#### **Case Narrative Certification Statement**

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melin Mann Melissa C. Mannion

Program Manager

4/26/3 Date



"Trent, Stephen J"
<Stephen\_J\_Trent@R

L.gov>

04/15/2003 04:41 PM To: "Melissa Mannion (E-mail)" <mmannion@eberlineservices.com>

CC:

Subject: FW: F03-003: SDGs H2093, H2098, and H2101 total U

#### Melissa,

It looks like we can cancel the isotopic analyses on the samples associated with the cited SDGs.

#### Steve

----Original Message-----

From: Cearlock, Christopher S

Sent: Tuesday, April 15, 2003 4:02 PM

To: Trent, Stephen J

Subject: RE: F03-003: SDGs H2093, H2098, and H2101 total U

Don't need any additional analysis for these SDGs.

----Original Message-----From: Trent, Stephen J

Sent: Tuesday, April 15, 2003 2:39 PM

To: Cearlock, Christopher S

Subject: F03-003: SDGs H2093, H2098, and H2101 total U

Chris,

Please find attached the preliminary total U data for SDGs H2093, H2098, and H2101. Let me know at your earliest convenience whether you need the lab to perform an isotopic analysis on any of the associated samples.

Thanks,

Steve Trent Sample Management Project Coordinator Fluor Hanford - Central Plateau Project Ph: (509) 373-5869

EFax: (866) 252-5816 Site Pager: 85-7344

## E B E R L I N E S E R V I C E S / R I C H M O N D SAMPLE DELIVERY GROUP H2098

SDG <u>7453</u> Contact <u>Melissa C. Mannion</u> Client Hanford
Contract No. 630
Case no SDG H2098

## SUMMARY DATA SECTION

TABLE OF	СО	N T	E N	T S	
About this section					1
Sample Summaries	•	•			3
Prep Batch Summary			•	•	5
Work Summary	•			•	6
Method Blanks				•	9
Lab Control Samples	•	•		•	12
Duplicates	•		•	•	14
Matrix Spikes	-	•	•	•	17
Data Sheets	•			•	18
Method Summaries	•	•		•	19
Report Guides	•	•	•	٠	31
End of Section	•	•	•	•	45
					ł

Melina	Marm

Prepared by

Melini Marmi

Reviewed by

#### SAMPLE DELIVERY GROUP H2098

SDG <u>7453</u>
Contact <u>Melissa C. Mannion</u>

#### REPORT GUIDE

Clie	ent	Han	ford	 
Contra	act	No.	630	 
Case	no	SDG	H2098	

#### ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

#### SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

#### PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

#### WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

#### METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

#### LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES
Page 1
SUMMARY DATA SECTION
Page 1

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford
Contract	No. 630
Case no	SDG H2098

#### ABOUT THE DATA SUMMARY SECTION

#### DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

#### MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

#### DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

#### METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

#### REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES
Page 2
SUMMARY DATA SECTION
Page 2

SDG 7453 Contact Melissa C. Mannion

## LAB SAMPLE SUMMARY

Client <u>Hanford</u> Contract No. 630 Case no SDG H2098

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R303039-05	Lab Control Sample	<del></del>	SOLID		F03-003		
R303039-06	Method Blank		SOLID		F03-003		
R303039-09	Lab Control Sample		SOLID		F03-003		
R303039-10	Method Blank		SOLID		F03-003		
R303053-01	B16541	Borehole B8828 100-102ft	SOLID		F03-003	F03-003-155	03/11/03 10:45
R303053-02	Duplicate (R303053-01)	Borehole B8828 100-102ft	SOLID		F03-003		03/11/03 10:45
R303053-03	Spike (R303053-01)	Borehole B8828 100-102ft	SOLID		F03-003		03/11/03 10:45
R303053-04	Duplicate (R303053-01)	Borehole B8828 100-102ft	SOLID		F03-003		03/11/03 10:45

LAB SUMMARY Page 1 SUMMARY DATA SECTION Page 3

Lab id EBRLNE Protocol <u>Hanford</u> Version <u>Ver 1.0</u> Form DVD-LS Version 3.06 Report date <u>04/26/03</u>

SDG	7453	
Contact	<u>Melissa C.</u>	Manni on_

## QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2098

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SAMPLE SOLIDS AMOUNT	BASIS AMOUNT	DAYS S		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7451		Method Blank	SOLID		_			R303039-06	7451-006
		Method Blank	SOLID					R303039-10	7451-010
		Lab Control Sample	SOLID					R303039-05	7451-005
		Lab Control Sample	SOLID					R303039-09	7451-009
7453	F03-003-155	B16541	SOLID	95.2 662.3 g		03/13/03	2	R303053-01	7453-001
		Duplicate (R303053-01)	SOLID	95.2 662.3 g		03/13/03	2	R303053-02	7453-002
		Duplicate (R303053-01)	SOLID	95.2 662.3 g		03/13/03	2	R303053-04	7453-004
		Spike (R303053-01)	SOLID	95.2 662.3 g		03/13/03	2	R303053-03	7453-003

QC SUMMARY
Page 1
SUMMARY DATA SECTION
Page 4

SDG 7453
Contact Melissa C. Mannion

#### PREP BATCH SUMMARY

Client	<u>Hanford</u>
Contract	No. 630
Case no	SDG_H2098

			PREPARATION ERR			·			- PLANCHETS ANALYZED				
TEST	MATRIX	METHOD	ВАТСН	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG MS/ORIG	FIERS		
Alpha	Spectros	сору					·						
AM	SOLID	Americium 241 in Soil	7043-127	5.0	1			1	1	1/1			
NP	SOLID	Neptunium in Soil	7043-127	5.0	1			1	1	1/1			
PU	SOLID	Plutonium, Isotopic in Solids	7043-127	5.0	1			1	1	1/1			
тн	SOLID	Thorium, Isotopic in Soil	7043-127	5.0	1		_	1	1	1/1			
Beta (	Counting		•							-			
SR	SOLID	Total Strontium in Soil	7043-127	10.0	1			1	1	1/1			
TC	SOLID	Technetium 99 in Soil	7043-127	10.0	1			1	1	1/1			
Gas Pi	roportion	al Counting	·•										
93A	SOLID	Gross Alpha în Soil	7043-127	20.0	1			1	1	1/1			
93в	SOLID	Gross Beta in Soil	7043-127	15.0	1			1	1	1/1			
Gamma	Spectros	copy									.,		
GAM	SOLID	Gamma Scan	7043-127	15.0	1			1	1	1/1			
Kinet	ic Phosph	orimetry											
U_T	SOLID	Uranium, Total in Soil	7043-127	9.0	1			1	1	1/1			
Liquid	d Scintil	lation Counting		_									
H	SOLID	Tritium in Soil	7043-127	10.0	1			1	1	1/1			
NI_L	SOLID	Nickel 63 in Soil	7043-127	10.0	1			1	1	1/1 1/1			

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY
Page 1
SUMMARY DATA SECTION
Page 5

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-PBS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

SDG 7453 Contact <u>Melissa C. Mannion</u>

## LAB WORK SUMMARY

Client <u>Hanford</u> Contract No. 630 Case no SDG\_H2098

LAB SAMPLE CLIENT SAMPLE ID										
COLLECTED RECEIVED	LOCATION Custody	SAF No	MATRIX	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	вч	METHOD
R303039-05	Lab Control Sam	ple		7451-005	93A/93		04/10/03	04/25/03	MCM	Gross Alpha in Soil
			SOLID	7451-005	93B/93		04/10/03	04/25/03	MCM	Gross Beta in Soil
		F03-003		7451-005	AM		04/07/03	04/25/03	MCM	Americium 241 in Soil
				7451-005	GAM		04/03/03	04/25/03	MCM	Gamma Scan
				7451-005	н		04/17/03	04/25/03	MCM	Tritium in Soil
				7451-005	NI_L		04/17/03	04/25/03	MCM	Nickel 63 in Soil
				7451-005	NP		04/10/03	04/25/03	MCM	Neptunium in Soil
				7451-005	PU		04/03/03	04/25/03	MCM	Plutonium, Isotopic in Solids
				7451-005	SR		04/03/03	04/25/03	MCM	Total Strontium in Soil
				7451-005	TC		04/15/03	04/25/03	MCM	Technetium 99 in Soil
•				7451-005	TH		04/03/03	04/25/03	MCM	Thorium, Isotopic in Soil
R303039-06	Method Blank			7451-006	93A/93		04/09/03	04/25/03	MCM	Gross Alpha in Soil
			SOLID	7451-006	93B/93		04/09/03	04/25/03	MCM	Gross Beta in Soil
		F03-003		7451-006	AM		04/07/03	04/25/03	MCM	Americium 241 in Soil
				7451-006	GAM		04/03/03	04/25/03	MCM	Gamma Scan
				7451-006	H		04/17/03	04/25/03	MCM	Tritium in Soil
				7451-006	NI_L		04/17/03	04/25/03	MCM	Nickel 63 in Soil
				7451-006	NP		04/10/03	04/25/03	MCM	Neptunium in Soil
				7451-006	PU		04/03/03	04/25/03	MCM	Plutonium, Isotopic in Solids
				7451-006	SR		04/03/03	04/25/03	MCM	Total Strontium in Soil
				7451-006	TC		04/14/03	04/25/03	MCM	Technetium 99 in Soil
				7451-006	TH		04/03/03	04/25/03	MCM	Thorium, Isotopic in Soil
R303039-09	Lab Control Sam	ple		7451-009	U_T		04/07/03	04/15/03	MCM	Uranium, Total in Soil
			SOLID		_					
		F03-003								
R303039-10	Method Blank			7451-010	U_T		04/07/03	04/15/03	MCM	Uranium, Total in Soil
-			SOLID							
		F03-003								

WORK SUMMARY Page 1 SUMMARY DATA SECTION Page 6

SDG 7453 Contact Melissa C. Mannion

## WORK SUMMARY, cont.

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H2098</u>

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE I LOCATION CUSTODY	D SAF No	MATRIX	PLANCHET	TEST	SUF- FIX		REVIEWED	вү	METHOD
R303053-01	B16541		· <del></del> _	7453-001	93A/93		04/10/03	04/26/03	MCM	Gross Alpha in Soil
03/11/03	Borehole B8828	100-102ft	SOLID	7453-001	93B/93		04/10/03	04/26/03	MCM	Gross Beta in Soil
03/17/03	F03-003-155	F03-003	00210	7453-001	AM		04/07/03		MCM	Americium 241 in Soil
03/ 13/ 03	103 003-133	105 005		7453-001	GAM			04/26/03	MCM	Gamma Scan
				7453-001	H			04/26/03	MCM	Tritium in Soil
				7453-001	NI_L		04/17/03		MCM	Nickel 63 in Soil
				7453-001	NP			04/26/03	MCM	Neptunium in Soil
				7453-001	PU		04/03/03		MCM	Plutonium, Isotopic in Solids
				7453-001	SR			04/26/03	MCM	Total Strontium in Soil
				7453-001	TC			04/26/03	MCM	Technetium 99 in Soil
				7453-001	TH			04/26/03	MCM	Thorium, Isotopic in Soil
				7453-001	U_T			04/15/03	MCM	Uranium, Total in Soil
R 303053-02	Duplicate (R303	3053-01)		7453-002	93A/93		04/10/03	04/26/03	MCM	Gross Alpha in Soil
03/11/03	Borehole B8828		SOLID	7453-002	93B/93		04/10/03	04/26/03	MCM	Gross Beta in Soil
03/13/03		F03-003		7453-002	AM		04/07/03	04/26/03	MCM	Americium 241 in Soil
				7453-002	GAM		04/09/03	04/26/03	MCM	Gamma Scan
				7453-002	Н		04/18/03	04/26/03	MCM	Tritium in Soil
				7453-002	NI_L		04/17/03	04/26/03	MCM	Nickel 63 in Soil
				7453-002	NP		04/10/03	04/26/03	MCM	Neptunium in Soil
				7453-002	PU		04/03/03	04/26/03	MCM	Plutonium, Isotopic in Solids
				7453-002	SR		04/03/03	04/26/03	MCM	Total Strontium in Soil
				7453-002	TC		04/14/03	04/26/03	MCM	Technetium 99 in Soil
				7453-002	TH		04/03/03	04/26/03	MCM	Thorium, Isotopic in Soil
R303053-03 03/11/03 03/13/03	Spike (R303053- Borehole B8828		SOLID	7453-003	NI_L	-	04/17/03	04/26/03	мсм	Nickel 63 in Soil
R303053-04 03/11/03 03/13/03	Duplicate (R303 Borehole B8828		SOLID	7453-004	U_T	<b></b> -	04/07/03	04/15/03	MCM	Uranium, Total in Soil

WORK SUMMARY
Page 2
SUMMARY DATA SECTION
Page 7

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LWS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

SDG 7453 Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client	<u>Hanford</u>
Contract	No. 630
Case no	SDG H2098

TEST	SAF No	COUNTS OF	TESTS BY SAN	IPLE TYPE  CLIENT MORE	RE BLANK	LCS	DUP SPIKE	TOTAL
93A/93	F03-003	Gross Alpha in Soil	900.0_ALPHABETA_GPC	1	1	1	1	4
93B/93	F03-003	Gross Beta in Soil	900.0_ALPHABETA_GPC	1	1	1	1	4
AM	F03-003	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1	1	1	1	4
GAM	F03-003	Gamma Scan	GAMMA_GS	1	1	1	1	4
Н	F03-003	Tritium in Soil	906.0_H3_LSC	1	1	1	1	4
NI_L	F03-003	Nickel 63 in Soil	NI63_LSC	1	1	1	1 1	5
NP	F03-003	Neptunium in Soil	NP237_LLE_PLATE_AEA	1	1	1	1	4
PU	F03-003	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1	1	1	1	4
SR	F03-003	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1	1	1	1	4
TC	F03-003	Technetium 99 in Soil	TC99_TR_SEP_LSC	1	1	1	1	4
TH	F03-003	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1	1	1	1	4
U_T	F03-003	Uranium, Total in Soil	UTOT_KPA	1	1	1	1	4
TOTALS				12	12	12	12 1	49

WORK SUMMARY Page 3 SUMMARY DATA SECTION Page 8

7451-006

### METHOD BLANK

Method Blank

Į.	7453 Melissa C. Mannion	Client/Case no Contract	 SDG_H2098
Lab sample id Dept sample id	=:	Client sample id Material/Matrix SAF No	 SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.066	1.6	3.0	10	υ	93A
Gross Beta	12587-47-2	-0.571	3.8	6.4	15	υ	93B
Tritium	10028-17-8	-0.102	0.16	0.28	400	U	H
Nickel 63	13981-37-8	-0.942	1.3	2.2	30	U	NI_L
Total Strontium	SR-RAD	-0.004	0.11	0.24	1.0	Ü	SR
Technetium 99	14133-76-7	0.050	0.17	0.53	15	U	TC
Thorium 228	14274-82-9	0	0.080	0.31		U	TH
Thorium 230	14269-63-7	0.080	0.16	0.31	1.0	ប	TH
Thorium 232	TH-232	0	0.080	0.31	1.0	ប	TH
Neptunium 237	13994-20-2	0.027	0.055	0.082	1.0	U	NP
Plutonium 238	13981-16-3	0	0.046	0.18	1.0	ប	PU
Plutonium 239/240	PU-239/240	0.023	0.046	0.18	1.0	υ	PÜ
Americium 241	14596-10-2	0.094	0.13	0.24	1.0	U	AM
Potassium 40	13966-00-2	U		1.3		U	GAM
Cobalt 60	10198-40-0	U		0.13	0.050	ប	GAM
Cesium 137	10045-97-3	U		0.053	0.10	บ	GAM
Radium 226	13982-63-3	U		0.11		ט	GAM
Radium 228	15262-20-1	U		0.24		U	GAM
Europium 152	14683-23-9	ט		0.13	0.10	บ	GAM
Europium 154	15585-10-1	ប		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	υ		0.078		บ	GAM
Thorium 232	TH-232	U		0.24		U	GAM
Uranium 235	15117-96-1	υ		0.22		ប	GAM
Uranium 238	U-238	ប		6.0		U	GAM
Americium 241	14596-10-2	U		0.28		U	G <b>AM</b>

200 Area Source Chara. 200-CS-1 OU

METHOD BLANKS
Page 1
SUMMARY DATA SECTION
Page 9

7451-006

## BLANK, cont.

Method Blank

	7453 Melissa C. Mannion	Client/Case no Contract	<del></del>	SDG_H2098
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No		SOLID

QC-BLANK 44208

METHOD BLANKS
Page 2
SUMMARY DATA SECTION
Page 10

7451-010

## METHOD BLANK

Method Blank

1	7453 Melissa C. Mannion	Client/Case no Contract	 SDG H2098
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No	 SOLID

ANALYTE CAS	RESULT NO pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pC1/g	QUALI- FIERS	TEST
Total Uranium (ug/g) 7440	-61-1 0	0.002	0.004	1.0	U	<b>ʊ_T</b>

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 44212

METHOD BLANKS
Page 3
SUMMARY DATA SECTION
Page 11

7451-005

## LAB CONTROL SAMPLE

Lab Control Sample

SDG <u>7453</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford SDG H2098</u> Contract <u>No. 630</u>
Lab sample id <u>R303039-05</u> Dept sample id <u>7451-005</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>F03-003</u>

ANALYTE	RESULT pCi/g	2ø ERR (COUNT)	MDA pCi/g	RDL pCî/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	204	15	4.0	10	<u> </u>	93A	214	8.6	95	69-131	70-130
Gross Beta	234	11	6.5	15		93B	232	9.3	101	75-125	70-130
Tritium	13.9	0.44	0.29	400		н	14.0	0.56	99	83-117	80-120
Nickel 63	260	4.3	1.8	30		NI_L	274	11	95	84-116	80-120
Total Strontium	22.1	1.1	0.35	1.0		SR	22.2	0.89	100	82-118	80-120
Technetium 99	124	2.2	0.53	15		TC	120	4.8	103	83-117	80-120
Thorium 230	46.9	4.6	0.27	1.0		TH	44.8	1.8	105	82-118	80-120
Neptunium 237	16.3	1.5	0.087	1.0		NP	21.8	0.87	<u>75</u>	87-113	80-120
Plutonium 238	26.5	2.6	0.20	1.0		PU	26.8	1.1	99	83-117	80-120
Plutonium 239/240	29.2	2.8	0.20	1.0		PU	29.0	1.2	101	83-117	80-120
Americium 241	19.6	2.1	0.23	1.0		AM	21.0	0.84	93	82-118	80-120
Cobalt 60	5.23	0.30	0.13	0.050		GAM	5.66	0.23	92	77-123	80-120
Cesium 137	5.35	0.26	0.16	0.10		GAM	5.40	0.22	99	76-124	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 4	4207				

LAB CONTROL SAMPLES
Page 1
SUMMARY DATA SECTION
Page 12

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LCS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

7451-009

#### LAB CONTROL SAMPLE

Lab Control Sample

	7453 Melissa C. Mannion	Client/Case no Contract	
Lab sample ic	- <del></del>	Material/Matrix	Lab Control Sample  SOLID  F03-003

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCī/g	REC %	3σ LMTS (TOTAL)	
Total Uranium (ug/g)	19.3	2.3	0.039	1.0		ז_ט	18.1	0.72	107	75-125	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 44211	
--------------	--

LAB CONTROL SAMPLES
Page 2
SUMMARY DATA SECTION
Page 13

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LCS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

#### DUPLICATE

SDG\_H2098 Client/Case no Hanford SDG 7453 Contract No. 630 Contact Melissa C. Mannion ORIGINAL DUPLICATE Client sample id B16541 Lab sample id <u>R303053-02</u> Lab sample id <u>R303053-01</u> Dept sample id <u>7453-001</u> Location/Matrix Borehole B8828 100-102ft SOLID Dept sample id 7453-002\_\_\_ Collected/Weight 03/11/03 10:45 662.3 g Received 03/13/03 % solids <u>95.2</u> Custody/SAF No <u>F03-003-155</u> <u>F03-003</u> % solids <u>95.2</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3 <i>σ</i> τοτ	PRO
Gross Alpha	7.36	3.6	4.0	10	·	93A	11.0	4.2	4.4		40	100	
Gross Beta	19.3	5.6	8.0	15		93B	16.4	4.7	6.5		16	69	
Tritium	-0.035	0.10	0.17	400	U	н	0.063	0.11	0.19	U	-		
Nickel 63	0.746	1.1	1.9	30	Ü	NI_L	1.01	1.2	2.0	U	-		
Total Strontium	-0.053	0.10	0.23	1.0	U	SR	-0.005	0.11	0.23	IJ	-		
Technetium 99	0.208	0.20	0.56	15	บ	TC	0.162	0.21	0.62	U	-		
Thorium 228	1.11	0.42	0.26			TH	0.966	0.37	0.27		14	82	
Thorium 230	1.18	0.43	0.26	1.0		TH	1.25	0.44	0.27		6	77	
Thorium 232	0.934	0.35	0.26	1.0		TH	0.643	0.29	0.27		37	87	
Neptunium 237	0	0.054	0.081	1.0	U	NP	0	0.056	0.084	υ	-		
Plutonium 238	-0.020	0.040	0.15	1.0	U	PU	0.025	0.050	0.19	U	-		
Plutonium 239/240	0	0.040	0.15	1.0	U	PU	0	0.050	0.19	U	-		
Americium 241	0.103	0.14	0.26	1.0	U	AM	-0.028	0.057	0.22	U	-		
Potassium 40	10.5	1.2	0.47			GAM	12.1	2.2	1.6		14	46	
Cobalt 60	U		0.088	0.050	U	GAM	U		0.13	U	-		
Cesium 137	U		0.074	0.10	U	GAM	U		0.095	U	-		
Radium 226	0.424	0.14	0.15			GAM	0.517	0.15	0.14		20	73	
Radium 228	0.536	0.28	0.30			GAM	0.482	0.44	0.54	υ	11	157	
Europium 152	Ц		0.16	0.10	U	GAM	U		0.25	U	-		
Europium 154	U		0.26	0.10	υ	GAM	U		0.36	U	-		
Europium 155	บ		0.19	0.10	U	GAM	U		0.24	U	-		
Thorium 228	0.584	0.086	0.092			GAM	0.553	0.11	0.12		5	49	
Thorium 232	0.536	0.28	0.30			GAM	0.482	0.44	0.54	U	11	157	
Uranium 235	U		0.28		U	GAM	U	· ·	0.38	U	-		
Uranium 238	U		8.8		U	GAM	U		15	U	-		
Americium 241	Ü		0.38		U	GAM	u		0.26	U	-		

200 Area Source Chara, 200-CS-1 OU

DUPLICATES Page 1 SUMMARY DATA SECTION Page 14

7453-002

DUPLICATE, cont.

B16541

SDG 7453 Contact Melissa C. Mannion		Client/Case no <u>Hanford</u> SDG H2098 Contract No. 630
DUPLICATE	ORIGINAL	
Lab sample id <u>R303053-02</u>	Lab sample id <u>R303053-01</u>	Client sample id <u>B16541</u>
Dept sample id <u>7453-002</u>	Dept sample id <u>7453-001</u>	Location/Matrix Borehole B8828 100-102ft SOLID
	Received <u>03/13/03</u>	Collected/Weight 03/11/03 10:45 662.3 g
% solids <u>95.2</u>	% solids <u>95.2</u>	Custody/SAF No <u>F03-003-155</u> <u>F03-003</u>

QC-DUP#1 44254

DUPLICATES
Page 2
SUMMARY DATA SECTION
Page 15

SAMPLE DELIVERY GROUP H2098

7453-004

### DUPLICATE

B16541

SDG <u>7453</u> Contact <u>Melissa C. Mannion</u>		Client/Case no <u>Hanford</u> <u>SDG_H2098</u> Contract <u>No. 630</u>
DUPLICATE	ORIGINAL	
Lab sample id <u>R303053-04</u>	Lab sample id <u>R303053-01</u>	Client sample id <u>B16541</u>
Dept sample id 7453-004	Dept sample id <u>7453-001</u>	Location/Matrix Borehole B8828 100-102ft SQLID
	Received <u>03/13/03</u>	Collected/Weight 03/11/03 10:45 662.3 g
% solids <u>95.2</u>	% solids <u>95.2</u>	Custody/SAF No <u>F03-003-155</u> <u>F03-003</u>

ANALYTE	DUPLICATE pCi/g	20 ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	PD %	3σ PROT TOT LIMIT
Total Uranium (ug/g)	0.599	0.068	0.004	1.0	<u> </u>	U_T	0.615	0.070	0.004	 3	31

200 Area Source Chara. 200-CS-1 OU

OC-DUP#1	44108	

DUPLICATES
Page 3
SUMMARY DATA SECTION
Page 16

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-DUP</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

7453-003

## MATRIX SPIKE

B16541

SDG 7453 Contact Melissa C. Mannion		Client/Case no <u>Hanford</u> <u>SDG H2098</u> Contract <u>No. 630</u>
MATRIX SPIKE	ORIGINAL	
Lab sample id <u>R303053-03</u>	Lab sample id <u>R303053-01</u>	Client sample id <u>B16541</u>
Dept sample id 7453-003	Dept sample id <u>7453-001</u>	Location/Matrix Borehole B8828 100-102ft SOLID
	Received <u>03/13/03</u>	Collected/Weight 03/11/03 10:45 662.3 g
% solids <u>95.2</u>	% solids <u>95.2</u>	Custody/SAF No <u>F03-003-155</u> <u>F03-003</u>

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS		ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g		REC 3σ LMTS P % (TOTAL)	
Nickel 63	896	9.1	2.2	30		NI_L	960	38	1.01	1.2	93 85-115	60-140

200 Area Source Chara. 200-CS-1 OU

MATRIX SPIKES
Page 1
SUMMARY DATA SECTION
Page 17

7453-001

#### DATA SHEET

B16541

)	7453 Melissa C. Mannion	Client/Case no Contract	
1		Collected/Weight	B16541  Borehole B8828 100-102ft SOLID  03/11/03 10:45 662.3 g  F03-003-155 F03-003

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	11.0	4.2	4.4	10		93A
Gross Beta	12587-47-2	16,4	4.7	6.5	15		93B
Tritium	10028-17-8	0.063	0.11	0.19	400	U	H
Nickel 63	13981-37-8	1.01	1.2	2.0	30	U	$NI_L$
Total Strontium	SR-RAD	-0.005	0.11	0.23	1.0	υ	SR
Technetium 99	<b>14133-76-</b> 7	0.162	0.21	0.62	15	U	TC
Thorium 228	14274-82-9	0.966	0.37	0.27			TH
Thorium 230	14269-63-7	1.25	0.44	0.27	1.0		$\mathbf{T}\mathbf{H}$
Thorium 232	TH-232	0.643	0.29	0.27	1.0		$\mathtt{TH}$
Total Uranium (ug/g)	7440-61-1	0.615	0.070	0.004	1.0		UΤ
Neptunium 237	13994-20-2	0	0.056	0.084	1.0	ซ	NP
Plutonium 238	13981-16-3	0.025	0.050	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.050	0.19	1.0	ช	PU
Americium 241	14596-10-2	-0.028	0.057	0.22	1.0	ប	AM
Potassium 40	13966-00-2	12.1	2.2	1.6			GAM
Cobalt 60	10198-40-0	U		0.13	0.050	ប	GAM
Cesium 137	10045-97-3	σ		0.095	0.10	ប	GAM
Radium 226	13982-63-3	0.517	0.15	0.14			GAM
Radium 228	15262-20-1	0.482	0.44	0.54		ប	GAM
Europium 152	14683-23-9	U		0.25	0.10	ប	GAM
Europium 154	15585-10-1	U		0,36	0.10	U	GAM
Europium 155	14391-16-3	ប		0.24	0.10	U	GAM
Thorium 228	14274-82-9	0.553	0.11	0.12			GAM
Thorium 232	TH-232	0.482	0.44	0.54		ប	GAM
Uranium 235	15117-96-1	ប		0.38		U	GAM
Uranium 238	U-238	U		15		บ	GAM
Americium 241	14596-10-2	ប		0.26		U	GAM

200 Area Source Chara. 200-CS-1 OU

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 18

SAMPLE DELIVERY GROUP H2098

Test AM Matrix SOLID SDG 7453 Contact Melissa C. Mannion

## LAB METHOD SUMMARY AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client <u>Hanford</u> Contract No. 630 Contract SDG H2098

RESULTS

	SUF- FIX PLANCHET	CLIENT SAMPLE ID	Americium 241	
Preparation batch	h 7043-127		· · · · · · · · · · · · · · · · · · ·	
R303039-05	7451-005	LCS (QC ID=44207)	ok	
R303039-06	7451-006	BLK (QC ID=44208)	U	
R303053-01	7453-001	B16541	U	
R303053-02	7453-002	Duplicate (R303053-01)	- U	

METHOD PERFORMANCE

SAMPLE ID	RAW TEST		ENT S	SAMPLE ID		MDA pCi/g	ALIQ g		DILU-	YIELD %	EFF %		FWHM keV	 	PREPARED	ANAL- YZED	DETECTOR
Preparation	batch	7043-12	27	2σ prep e	rror !	5.0 %	Reference	Lab	Notebool	7043	pg.	127					
R303039-05		LCS	(QC	ID=44207)		0.23	0.500			70		126			04/07/03	04/07	ss-043
R303039-06		BLI	(QC	ID=44208)		0.24	0.500			65		126			04/07/03	04/07	55-044
R303053-01		B16	5541			0.22	0.500			75		126		27	04/07/03	04/07	ss-047
R303053-02		Duţ		te (R303053 ID=44254)	-01)	0.26	0.500			62		126		27	04/07/03	04/07	ss-048
Nominal valu	ues an	d limits	from	m method		1.0	0.500			20-10	 5	100	100	 180			<del></del> -

	PROCEDURES	CP-060	AMCMISO_IE_PLATE_AEA Soil Preparation, rev 4
ĺ		CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
		CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 3
ĺ		CP-008	Heavy Element Electroplating, rev 7

MDA \_\_0.24 ± \_\_0.034 AVERAGES ± 2 SD FOR 4 SAMPLES YIELD \_\_68 ± \_\_11\_

METHOD SUMMARIES Page 1 SUMMARY DATA SECTION Page 19

SAMPLE DELIVERY GROUP H2098

Test NP Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

#### LAB METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H2098</u>

RESULTS

LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	CLIENT SAMPLE ID	Neptunium 237	
Preparation	batch 7043-127			
R303039-05	7451-005	LCS (QC ID=44207)	LOW	
R303039-06	7451-006	BLK (QC ID=44208)	U	
R303053-01	7453-001	B16541	U	
R303053-02	7453-002	Duplicate (R303053-01)	- U	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW !		SAMPLE ID	MDA pCi/g			DILU- Tion	YIELD %				DR I FT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation	batch	7043-127	2σ prep error	5.0 %	Reference	Lab	Notebool	c 7043	pg.	127					- <del></del> -	
R303039-05		LCS (	C ID=44207)	0.08	7 0.500			71		138				04/10/03	04/10	SS-013
R303039-06		BLK (	C ID=44208)	0.08	2 0.500			68		138				04/10/03	04/10	SS-014
R303053-01		B16541	1	0.08	4 0.500			69		138			30	04/10/03	04/10	SS-016
R303053-02			cate (R303053-01) AC ID=44254)	0.08	1 0.500			73		139			30	04/10/03	04/10	SS-031
Nominal valu	ues and	limits f	om method	1.0	0.500			20-105	5	100	-		180	<del> </del>		

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
1	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
}	CP-934	Neptunium from Solids and Water by Extraction
		Chromatography, rev 3

AVERAGES ± 2 SD	MDA	0.084	±	0,005
FOR 4 SAMPLES	YIELD		Ì	4

METHOD SUMMARIES
Page 2
SUMMARY DATA SECTION
Page 20

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LMS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

Test PU Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

### LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client	<u>Hanford</u>
Contract	No. 630
Contract	SDG H2098

RESULTS

LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	CLIENT SAMPLE ID	Plutonium 238	Plutonium 239/240	
Preparation	batch 7043-127				
R303039-05	7451-005	LCS (QC ID=44207)	ok	ok	
R303039-06	7451-006	BLK (QC ID=44208)	Ü	U	
R303053-01	7453-001	в16541	U	U	
R303053-02	7453-002	Duplicate (R303053-01)	- U	- U	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST		SAMPLE ID	MAX ME pCi/g			DILU-	X X			FWHM keV	 	PREPARED	ANAL - YZED	DETECTOR
Preparation	batch	7043-127	2σ prep err	or 5.0 %	Reference	Lab	Notebool	k 7043	pg.	127					
R303039-05		LCS (	C ID=44207)	0.20	0.500			66		159			04/03/03	04/03	SS-042
R303039-06		BLK (	C ID=44208)	0.18	0.500			73		158			04/03/03	04/03	SS-043
R303053-01		B16541		0.19	0.500			58		158		23	04/03/03	04/03	SS-045
R303053-02		•	ate (R303053-0 RC ID=44254)	0.15	0.500			84		159		23	04/03/03	04/03	SS-047
Nominal valu	Jes an	d limits f	om method	1.0	0.500			20-105	5	100	100	180	·		<del></del>

PROCEDURES REFERENCE PUISO_PLATE_AEA	
CP-060 Soil Preparation, rev 4	
CP-071 Soil Dissolution, > 1.0g Aliquot, rev 2	
CP-941 Plutonium in Water and Dissolved Samples by	•
Extraction Chromatography, rev 1	
CP-008 Heavy Element Electroplating, rev 7	

AVERAGES ± 2 SD MDA 0.18 ± 0.043
FOR 4 SAMPLES YIELD 70 ± 22

METHOD SUMMARIES
Page 3
SUMMARY DATA SECTION
Page 21

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LMS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

Test TH Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

#### LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

RAW SUF-T.AB Thorium 230 CLIENT SAMPLE ID SAMPLE ID TEST FIX PLANCHET Preparation batch 7043-127 R303039-05 7451-005 LCS (QC ID=44207) ok BLK (QC ID=44208) u R303039-06 7451-006 R303053-01 7453-001 B16541 1.25 Duplicate (R303053-01) ok 7453-002 R303053-02 Nominal values and limits from method RDLs (pCi/g) 1.0

METHOD PERFORMANCE

200 Area Source Chara, 200-CS-1 OU

	SUF- F FIX CLIENT	SAMPLE ID	MAX MD pCi/g		PREP FAC	DILU- Tion	YIELD %			 DRIFT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation bate	ch 7043-127	2ø prep error	5.0 %	Reference	Labi	Noteboo	k 7043	pg.	127					
R303039-05	LCS (QC	C ID=44207)	0.27	0.250			87		174			04/03/03	04/03	\$\$-042
R303039-06	BLK (Q	C (D=44208)	0.31	0.250			75		177			04/03/03	04/03	ss-043
R303053-01	B16541		0.27	0.250			73		176		23	04/03/03	04/03	SS-045
R303053-02	•	ate (R303053-01) C ID=44254)	0.26	0.250			87		177		23	04/03/03	04/03	SS-047
Nominal values	and limits fro	om method	1.0	0.250			20-10	5	150		180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-907	Thorium in Water and Dissolved Solid Samples by
		TEVA and Anion Exchange Column Method, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD MDA 0.28 ± 0.044 FOR 4 SAMPLES YIELD 80 ± 15

METHOD SUMMARIES
Page 4
SUMMARY DATA SECTION
Page 22

SAMPLE DELIVERY GROUP H2098

Test <u>SR</u> Matrix <u>SOLID</u>
SDG <u>7453</u>
Contact <u>Melissa C. Mannion</u>

#### LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H2098</u>

RESULTS

<u> </u>	FIX PLANCHET	CLIENT SAMPLE ID	Strontium	
Preparation bate	h 7043-127			
R303039-05	7451-005	LCS (QC ID=44207)	ok	
R303039-06	7451-006	BLK (QC ID=44208)	U	
R303053-01	7453-001	B16541	U	
R303053-02	7453-002	Duplicate (R303053-01)	- U	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST		IENT S	SAMPLE ID	MDA pCi/g	ALIQ 9		DILU- Tion	YIELD %			 	• • • • • •	PREPARED	ANAL- YZED	DETECTOR
Preparation	batch	7043-1	27	2σ prep error	10.0 %	Reference	Lab	Notebool	7043	pg.	127	 				
R303039-05		LC	s (QC	ID=44207)	0.35	1.00			78		60			04/03/03	04/03	GRB-208
R303039-06		BL	K (QC	ID=44208)	0.24	1.00			77		100			04/03/03	04/03	GRB-220
R303053-01		В1	6541		0.23	1.00			92		100		23	04/03/03	04/03	GRB-231
R303053-02		Du	•	e (R303053-01) ID=44254)	0.23	1.00			87		100		23	04/03/03	04/03	GRB-232
Nominal valu	Jes an	d limit	s from	n method	1.0	1.00			30-10	5	100	 	180		<u> </u>	

I	PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
		CP-060	Soil Preparation, rev 4
		CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
		CP-381	Strontium in Solids, rev 1

AVERAGES ± 2 SD	MDA _	0.26	±	0.12
FOR 4 SAMPLES	YIELD _	_84	±	14

METHOD SUMMARIES
Page 5
SUMMARY DATA SECTION
Page 23

SAMPLE DELIVERY GROUP H2098

Test TC Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

#### LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

RESULTS

	T FIX PLANCHET	CLIENT SAMPLE ID	99		
Preparation bat	ch 7043-127				
R303039-05	7451-005	LCS (QC ID=44207)	ok		
R303039-06	7451-006	BLK (QC ID=44208)	Ü		
R303053-01	7453-001	B16541	U		
R303053-02	7453-002	Duplicate (R303053-01)	-	U	

METHOD PERFORMANCE

TAB SAMPLE ID	RAW SUF- TEST FIX C	LIENT S	SAMPLE ID	MDA pCi/g		PREP FAC	DILU- Tion	YIELD			FWHM keV	 	PREPARED	ANAL- YZED	DETECTOR
Preparation	batch 7043-	127	2σ prep error	10.0 %	Reference	Lab	Notebool	k 7043	pg.	127					
R303039-05	LC	s (QC	ID=44207)	0.53	1.00			94		50			04/10/03	04/15	GRB-222
R303039-06	BI	K (QC	ID=44208)	0.53	1.00			97		50			04/10/03	04/14	GRB-219
R303053-01	В'	16541		0.62	1.02			84		50		34	04/10/03	04/14	GR8-221
R303053-02	Do	•	te (R303053-01) ID=44254)	0.56	1.02			87		50		34	04/10/03	04/14	GRB-222
Nominal valu	aes and limit	s from	n method	15	1.00		<del></del>	20-105	5	50	•••	 180	<u>-</u>		

PROCEDURES	REFERENCE CP-071	TC99_TR_SEP_LSC Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 2
	CP-002	Q.C. Preparation, rev 4
	CP-003	Addition of Carriers and Tracers, rev 5
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD	MDA _	0,56	±	0.085
FOR 4 SAMPLES	YIELD _	90	ŧ	12

METHOD SUMMARIES
Page 6
SUMMARY DATA SECTION
Page 24

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LMS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

Test <u>93A</u> Matrix <u>SOLID</u> SDG <u>7453</u>

Contact Melissa C. Mannion

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H2098

#### RESULTS

Preparation	batch 70	43-127			
R303039-05	93	7451-005	LCS (QC ID=44207)	ok	
R303039-06	93	7451-006	BLK (QC ID=44208)	U	
R303053-01	93	7453-001	B16541	11.0	
R303053-02	93	7453-002	Duplicate (R303053-01)	ok	

## METHOD PERFORMANCE

SAMPLE ID	RAW TEST		SAMPLE ID	MDA pCi/s		PREP FAC	DILU-	RESID mg	EFF %			DRIFT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation	batch	7043-127	2σ prep error	20.0 %	Reference	Lab	Notebook	7043	pg.	127						
R303039-05	93	LCS (QC	ID=44207)	4.0	0.100			25		100				04/08/03	04/10	GRB-115
R303039-06	93	BLK (QC	ID=44208)	3.0	0.100			24		100				04/08/03	04/09	GRB-105
R303053-01	93	B16541		4.4	0.100			36		100			30	04/08/03	04/10	GRB-115
R303053-02	93	•	te (R303053-01) ID=44254)	4.0	0.100			36		100	_		30	04/08/03	04/10	GRB-114
Nominal valu	ues an	d limits fro	m method	10	0.100			5-250	0	100			180		-	

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD MDA 3.8 ± 1.2

FOR 4 SAMPLES RESIDUE 30 ± 13

METHOD SUMMARIES
Page 7
SUMMARY DATA SECTION
Page 25

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LMS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

Test 93B Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

#### LAB METHOD SUMMARY

GROSS BETA IN SOIL
GAS PROPORTIONAL COUNTING

| Client <u>Hanford</u> | Contract <u>No. 630</u> | Contract <u>SDG H2098</u> |

RESULTS

IAB SAMPLE ID	RAW SUF-	PLANCHET	CLIENT SAMPLE ID	Gross Beta	
Preparation	batch 704	3-127			
R303039-05	93	7451-005	LCS (QC ID=44207)	ok	
R303039-06	93	7451-006	BLK (QC ID=44208)	U	
R303053-01	93	7453-001	B16541	16.4	
R303053-02	93	7453-002	Duplicate (R303053-01)	ok	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX CLIE	NT SAMPL	E ID	MDA pCī/	ALIQ 9	PREP FAC	DILU- TION	RESID mg	EFF %		 •		PREPARED	ANAL- YZED	DETECTOR
Preparation	batch	7043-127	2σ	prep error	15.0 %	Reference	Lab	Notebool	 c 7043	pg.	127					
R303039-05	93	LCS	QC ID=4	4207)	6.5	0.100			25		100			04/08/03	04/10	GRB-115
R303039-06	93	BLK	QC ID=4	4208)	6.4	0.100			24		100			04/08/03	04/09	GRB-105
R303053-01	93	B1654	41		6.5	0.100			36		100		30	04/08/03	04/10	GRB-115
R303053-02	93		icate (R (QC ID=4	303053-01) 4254)	8.0	0.100			36		100		30	04/08/03	04/10	GR8-114
Nominal valu	ues an	d limits	from met	hod	15	0.100			5-25	0	100	 	180	·		

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
ł	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD MDA 6.8 ± 1.5
FOR 4 SAMPLES RESIDUE 30 ± 13

METHOD SUMMARIES
Page 8
SUMMARY DATA SECTION
Page 26

SAMPLE DELIVERY GROUP H2098

Test GAM Matrix SOLID
SDG 7453
Contact Melissa C. Mannion

### LAB METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H2098</u>

RESULTS

Preparation bate	ch 7043-127				
R303039-05	7451-005	LCS (QC ID=44207)	ok	ok	
R303039-06	7451-006	BLK (QC ID=44208)	U	ប	
R303053-01	7453-001	в16541	U	U	
R303053-02	7453-002	Duplicate (R303053-01)	- U	-	U

METHOD PERFORMANCE

LAB SAMPLE ID	RAW SUF	:- CLIENT S	AMPLE ID	MDA pCi/g			DILU-	YIELD %			 DRIFT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation	batch 70	43-127	2σ prep error	15.0 %	Reference	Lab	Notebook	7043	pg.	127	 				
R303039-05		LCS (QC	ID=44207)	0.13	_ 189					118			03/28/03	04/03	MB,05,00
R303039-06		BLK (QC	ID=44208)	0.40	_ 189					118			03/28/03	04/03	MB,08,00
R303053-01		816541		0.73	188					107		31	03/28/03	04/11	JR,03,00
R303053-02		•	e (R303053-01) ID=44254)	0.63	188					149		29	03/28/03	04/09	JR,05,00
Nominal valu	ues and l	imits from	method	0.05	0 189		<del></del>			100	 	180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 4
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 5

METHOD SUMMARIES
Page 9
SUMMARY DATA SECTION
Page 27

SAMPLE DELIVERY GROUP H2098

Test U T Matrix SOLID

SDG 7453
Contact Melissa C. Mannion

#### LAB METHOD SUMMARY

URANIUM, TOTAL IN SOIL KINETIC PHOSPHORIMETRY

Client	Hanford
Contract	No. 630
Contract	SDG H2098

RESULTS

Preparation b	atch 7043-127		
R303039-09	7451-009	LCS (QC ID=44211)	ok
R303039-10	7451-010	BLK (QC 1D=44212)	U .
R303053-01	7453-001	B16541	0.615
R303053-04	7453-004	Duplicate (R303053-01)	ok

METHOD PERFORMANCE

SAMPLE ID	RAW S		LIENT	SAMPLE I	D	MDA ug/g	ALIC J 9	PRE FA		YIELD %					PREPARED	ANAL- YZED	DETECTOR
Preparation	batch	7043-	127	2σ рге	p error	9.0 %	Referenc	e Lab	Noteboo	k 7043	pg.	127			·		
R303039-09		L	cs (QC	ID=4421	1)	0.03	9 0.100	)							04/07/03	04/07	KPA-001
R303039-10		В	LK (QC	ID=4421	2)	0.00	4 0.100	)							04/07/03	04/07	KPA-001
R303053-01		8	16541			0.00	4 0.100	כ						27	04/07/03	04/07	KPA-001
R303053-04		Di	•	te (R303 ID=4419		0.00	4 0.100	)						27	04/07/03	04/07	KPA-001
Nominal val	ues and	d Limi	ts fro	n method		1.0	0.100	)						180		<del>_</del>	

PROCEDURES REFE	ENCE UTOT_KPA
CP-06	O Soil Preparation, rev 4
CP-0	1 Soil Dissolution, > 1.0g Aliquot, rev 2
CP-04	4 Sample Preparation for Total Uranium by Kinetic
	Phosphorimetry, rev 4
CP-97	8 Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD MDA 0.013 ± 0.035 FOR 4 SAMPLES YIELD \_\_\_\_ ± \_\_\_\_

METHOD SUMMARIES
Page 10
SUMMARY DATA SECTION
Page 28

Lab id <u>EBRLNE</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LMS</u>

Version <u>3.06</u>

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

Test H Matrix SOLID SDG 7453 Contact Melissa C. Mannion

## LAB METHOD SUMMARY TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford Contract No. 630 Contract SDG H2098

RESULTS

RAW SUF-LAB

Tritium SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID

Preparation batch 7043-127

LCS (QC ID=44207) ok R303039-05 7451-005 7451-006 BLK (QC ID=44208) Ħ R303039-06 7453-001 B16541 R303053-01 7453-002 Duplicate (R303053-01) U R303053-02

Nominal values and limits from method

RDLs (pCi/g) 400

200 Area Source Chara. 200-CS-1 OU

METHOD PERFORMANCE

TAB SAMPLE ID	RAW :	SUF- FIX CLIENI	SAMPLE	ID	MDA pCi/s	ALIQ g	PREP	DILU-	YIELD %			 DR I FT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation	batch	7043-127	2 <i>o</i> pr	ep error	10.0 %	Reference	Lab	Noteboo	k 7043	pg.	127					
R303039-05		LCS (G	C ID=442	207)	0.29	20.0			33		120			04/16/03	04/17	LSC-005
R303039-06		BLK (G	C ID=442	208)	0.28	20.0			33		120			04/16/03	04/17	LSC-005
R303053-01		B16541			0.19	20.8			51		120		38	04/16/03	04/18	LSC-005
R303053-02		•	ate (R30 C ID=442	3053-01) 254)	0.17	21.0			51		120		38	04/16/03	04/18	LSC-005
Nominal valu	ues and	d limits fr	om metho	od	400	20.0					25		180			

PROCEDURES REFERENCE 906.0 H3 LSC

CP-218 Tritium in Soil Samples by Azeotropic

Distillation, rev 1

AVERAGES ± 2 SD MDA <u>0.23</u> ± <u>0.12</u> FOR 4 SAMPLES YIELD 42 ± 21

METHOD SUMMARIES Page 11 SUMMARY DATA SECTION Page 29

Lab id EBRLNE Protocol Hanford Version <u>Ver 1.0</u> Form DVD-LMS Version 3.06

Report date <u>04/26/03</u>

SAMPLE DELIVERY GROUP H2098

Test NI L Matrix SOLID

SDG 7453

Contact Melissa C. Mannion

#### LAB METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

	<del>.</del>
Client	<u>Hanford</u>
Contract	No. 630
Contract	SDG_H2098
Contract	No. 630

RESULTS

RAW SUF-SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63 Preparation batch 7043-127 LCS (QC ID=44207) ok R303039-05 7451-005 R303039-06 7451-006 BLK (QC ID=44208) IJ B16541 R303053-01 7453-001 U R303053-02 7453-002 Duplicate (R303053-01) U R303053-03 7453-003 Spike (R303053-01) ok Nominal values and limits from method RDLs (pCi/g) 30 200 Area Source Chara, 200-CS-1 OU

METHOD PERFORMANCE

LAB SAMPLE ID	RAW SUF- TEST FIX CLIENT	SAMPLE ID	MDA pCi/s			DILU-	YIELD %			 DR I FT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation	batch 7043-127	2σ prep error	10.0 %	Reference	Lab N	otebook	7043	рg.	127			······································		
R303039-05	LCS (Q	C ID=44207)	1.8	0.500			100		100			04/16/03	04/17	LSC-007
R303039-06	BLK (Q	C ID=44208)	2.2	0.500			100		100			04/16/03	04/17	LSC-007
R303053-01	B16541		2.0	0.500			100		100		37	04/16/03	04/17	LSC-007
R303053-02	•	ate (R303053-01) C ID=55254)	1.9	0.500			100		100		37	04/16/03	04/17	LSC-007
R303053-03	•	(R303053-01) C ID=55255)	2.2	0.500			100		74		37	04/16/03	04/17	LSC-007
Nominal val	ues and limits fr	om method	30	0.500			30-10	5	50		180		-	

	PROCEDURES	REFERENCE	N163_LSC
		CP-060	Soil Preparation, rev 4
		CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
ļ		CP-281	Nickel-63 Purification By Extraction
ĺ			Chromatography, rev 0

AVERAGES ± 2 SD MDA 2.0 ± 0.36
FOR 5 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES
Page 12
SUMMARY DATA SECTION
Page 30

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

#### REPORT GUIDE

Client	Hanford		
Contract	No.	630	
Case no	SDG	H2098	

#### SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- LAB SAMPLE ID is the lab's primary identification for a sample.
- \* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- \* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- \* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

\* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

Page 1
SUMMARY DATA SECTION

Page 31

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client	Hanford		
Contract	No.	630	
Case no	SDG	H2098	

#### PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- \* The preparation batches are shown in the same order as the Method Summary Reports are printed.
- \* Only analyses of planchets relevant to the SDG are included.
- \* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- \* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

REPORT GUIDES
Page 2
SUMMARY DATA SECTION
Page 32

SAMPLE DELIVERY GROUP H2098

SDG <u>7453</u> Contact <u>Melissa C. Mannion</u>

#### REPORT GUIDE

Client	Hanford		
Contract	No. 630		
Case no	SDG H2098		

#### WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- \* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- \* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- \* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- \* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- \* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- \* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

Page 33

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

#### REPORT GUIDE

Clie	nt	Hanford			
Contra	ct	No.	630		
Case	no	SDG	H2098	_	

#### DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- \* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- \* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- \* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- \* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- \* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

REPORT GUIDES
Page 4
SUMMARY DATA SECTION
Page 34

SAMPLE DELIVERY GROUP H2098

SDG <u>7453</u> Contact <u>Melissa C. Mannion</u>

GUIDE, cont.

Client	Hanford	
Contract	No. 630	
Case no	SDG_H2098	

#### DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

\* An MDA is underlined if it is bigger than its RDL.

REPORT GUIDES
Page 5
SUMMARY DATA SECTION
Page 35

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford		
Contract	No. 630		
Case no	SDG_H2098		

#### DATA SHEET

- \* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- \* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- \* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Page 6

SUMMARY DATA SECTION

Page 36

Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-RG</u>
Version <u>3.06</u>

Report date <u>04/26/03</u>

Lab id EBRLNE

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

#### REPORT GUIDE

Client	Han	Hanford		
Contract	No.	630		
Case no	SDG	H2098		

#### LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- \* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  - 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 37

SAMPLE DELIVERY GROUP H2098

SDG 7453 Contact Melissa C. Mannion

#### REPORT GUIDE

Client	Hanford		
Contract	No. 630		
Case no	SDG_H2098		

#### DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

\* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

\* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

\* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- \* The second limit for the RPD is the larger of:
  - 1. A fixed percentage specified in the protocol.

REPORT GUIDES
Page 8
SUMMARY DATA SECTION
Page 38

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford		
Contract	No.	630	
Case no	SDG	H2098	

#### DUPLICATE

- 2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.
- \* The RPD is underlined if it is greater than either limit.
- \* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

\* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

REPORT GUIDES
Page 9
SUMMARY DATA SECTION
Page 39

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

REPORT GUIDE

Client	Hanford		
Contract	No.	630	
Case no	SDG	H2098	

#### MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

\* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

\* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- \* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  - 1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- The second limits are protocol defined upper and lower QC limits

REPORT GUIDES
Page 10
SUMMARY DATA SECTION
Page 40

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford				
Contract	No.	630			_
Case no					

#### MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

\* The recovery is underlined (out of spec) if it is outside either of these ranges.

REPORT GUIDES
Page 11
SUMMARY DATA SECTION
Page 41

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

#### REPORT GUIDE

Client	Hanford		
Contract	No.	630	
Case no	SDG	H2098	

#### METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

\* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

\* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

\* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- \* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- \* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

REPORT GUIDES
Page 12
SUMMARY DATA SECTION
Page 42

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford		
Contract			
Case no	SDG	H2098	

#### METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- \* Aliquots are underlined if less than the nominal value specified for the method.
- \* Prepareation factors are underlined if greater than the nominal value specified for the method.
- \* Dilution factors are underlined if greater than the nominal value specified for the method.
- \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES
Page 13
SUMMARY DATA SECTION
Page 43

SAMPLE DELIVERY GROUP H2098

SDG <u>7453</u>
Contact <u>Melissa C. Mannion</u>

GUIDE, cont.

Client	Han	ford		
Contract	No.	630		
Case no	SDG	H2098	 	

#### METHOD SUMMARY

- \* Count times are underlined if less than the nominal value specified for the method.
- \* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- \* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- \* Days Held are underlined if greater than the holding time specified in the protocol.
- \* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

REPORT GUIDES
Page 14
SUMMARY DATA SECTION
Page 44

SAMPLE DELIVERY GROUP H2098

SDG 7453
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hani	ord	
Contract	No.	630	
Case no	SDG	H2098	

#### METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 45

FH-Central Platea	ıu Project	CI	HAIN OF CUST	ODY/S	AMPLE	ANALY	YSIS	REQUEST	,	F03	-003-155	Page 1 c	of <u>1</u>
Collector Fahlberg/Johansen/Thomas			any Contact Cearlock	Telepho 373-3				Project Coordin TRENT, SJ	nator P	rice Code	8N	Data Turi	1
Project Designation 200 Area Source Characterize	ation 200-CS-1 OU - Soil Sar	npl Sampl	ing Location chole B8828 (100-102 ft)	H21	7) 890	453)		SAF No. F03-003	A	ir Quality		45 I	pays
Ice Chest No. FRC	02-003		Logbook No. F-N-3251			50 v e ca	55 <i>1</i> 0	Method of Ship Federal Expre					
Shipped To EBERLINE SERVICES (For		Offsite	e Property No.	AO3	30 15	- q		Bill of Lading/	Air Bill No	7922	-0684	144	<u> </u>
POSSIBLE SAMPLE HAZA			Preservation	Coal 4C	Cool 4C	Cool 4C	Cool	4C None	None	None	None	None	
Special Handling and/or S	BISXMI		Type of Container	aG	aG	aG	aC	G aG	aG.	аG	aG	aG	
Now			No. of Container(s)	1	l i	1	1	100	1	1 125mL	1 17/153-7-63	1 125mL	
			Volume	250mL VOA - 8260/	250mL	250mL	250		500mL		500 mc	Nickel-63:	
	SAMPLE ANALYSI	See item (1) in Special Instructions.	( gypa )	<b>Р</b> СВ:	- 8082   See item (2) in Special Instructions.	See item (3) i Special Instructions,	9045	See item (4) in Special Insuructions.	Technetium- 99; Tritium - H3	·			
Sample No.	Matrix * .	Sample Date	Sample Time										
B16541	SOIL 3	3-11-03	1045		<del> </del>	<del> </del>	-				X	×	
	<del></del>			<del> </del>	<del></del>	<del> </del>	<del> </del>	<del></del>		-	<del></del>	<del> </del>	<del></del> -
CHAIN OF POSSESSIO Relinquished By/Removed From Relinquished By/Removed From K. GLER R. L	Date/Time  0.3  1/03 1230  Date/Time (2 > 0)	18 3	RA 114 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	ate/Time ////03 / ate/Time /-	)30 Lab D a Ans	nalysis. FH acki dyze pH within Semi-VOA — 8	as a TIC nowledge 24 hr of: 270A (A	C if detectable, and rees that the holding time receipt.  Add-On) (Tribuny) phonorrows: (Australia)	ne for Nitrate  osphate); TP  Barium, Cadr	by EPA 300.0  H-Diesel Rang	or 9056 will no e - WTPH-D m, Lead, Selem	to be met.	Matrix * S=Soil SE=Sodiment SO=Solid Si=Studge W = Water
Relinguished By/Removed From Relinguished By/Removed From	PC Date/Time 1000 W 16c 3.1203	Received By/Stored In    Comparison of the Compa								BS/Chem Spite  Te-Tissue Wi-Wipe Le-Liquid V=Vegetation X=Other			
Relinquished By/Removed From  LABORATORY   Received E SECTION		Received By/Sto	ored in U	eate/Time	Title			<u>-</u>	<del></del>	<del></del>		Date/Time	
FINAL SAMPLE Disposal N DISPOSITION	fethod	·············			<del></del>	Disp	osed By					Date/Time	



# **ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

# SAMPLE RECEIPT CHECKLIST

Client:FLR	Date/Time received 1000 3-13-3
coc No. FU3-003-155	
Container I.D. No. ERC-02-003 Requested TA	T (Days) 45 P.O. Received Yes [] No []
INSPEC	TION
Custody seals on shipping container intact?	Yes [ ] No [ ] N/A [ ]
2. Custody seals on shipping container dated 8	
3. Custody seals on sample containers intact?	Yes [ ] No [ ] N/A [ ]
4. Custody seals on sample containers dated &	signed? Yes [ No [ ] N/A [ ]
5. Packing material is:	Wet [ ] Dry [ L]
6. Number of samples in shipping container:	- <del></del>
7. Number of containers per sample:	
8. Paperwork agrees with samples?	Yes [ No [ ]
9. Samples have: Tape [ ] Hazard labels [ ]	Rad labels [ ] Appropriate sample labels [ [ ]
10. Samples are: In good condition [ ] Leak	ing [ ] Broken Container [ ] Missing [ ]
11. Samples are: Preserved [ ] Not preserved	I [ Y Preservative
12. Describe any anomalies:	
13. Was P.M. notified of any anomalies? Yes	
14. Received by Aba (//	
·	Customer Sample
B 16541 SO OF 19 wipe	No. cpm mR/hr wipe
lon Chamber Ser. No.	Calibration date
Alpha Meter Ser. No.	Calibration date
Beta/Gamma Meter Ser. No.	Calibration date

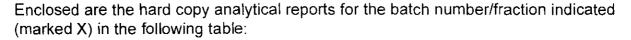


11 April 2003

Mr. Steve Trent Fluor Hanford Inc. 825 Jadwin Ave. Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:



0303L932
H2098
F03-003
3-13-03
1
Soil
Χ
Χ
Χ
Χ
X
Χ
· X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laporatory Incorporated

Orlette S. Johnson Project Manager

r:\group\pm\orlette\tnu-hanford\data\fc\_ltrs.doc

# Lionville Laboratory, Inc. VOA ANALYTICAL DATA PACKAGE FOR TNU-HANFORD F03-003, # 2098

RFW LOT # :0303L932

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
					<del></del>		
B16541	001	s	03LVH048	03/11/03	03/13/03	N/A	03/14/03
B16541	001 MS	S	03LVH048	03/11/03	03/13/03	N/A	03/14/03
B16541	001 MSD	S	03LVH048	03/11/03	03/13/03	N/A	03/14/03
LAB QC:							
VBLKLM	MB1	S	03LVH048	N/A	N/A	N/A	03/14/03
VBLKLM	MB1 BS	S	03LVH048	N/A	N/A	N/A	03/14/03





Client: TNU-HANFORD F03-003

LVL #: 0303L932

SDG/SAF # H2098/F03-003

W.O. #: 11343-606-001-9999-00 Date Received: 03-13-2003

#### **GC/MS VOLATILE**

One (1) soil sample was collected on 03-11-2003.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL volatile target compounds on 03-14-2003.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
- 2. The sample was analyzed within holding time.
- 3. Non-target compounds were not detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. Internal standard area and retention time criteria were met.
- 8. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor

President

Lionville Laboratory Incorporated

som\group\data\voa\tnu-hanford\0303-932.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 0 pages.

Doto

# **GLOSSARY**

#### **DATA QUALIFIERS**

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



3

# **GLOSSARY**

#### **ABBREVIATIONS**

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.



4

#### TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP Missed Peak: manually added peak not found by automatic quan program.
- PA Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



# Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 03/18/03 15:10 Client: TNU-HANFORD F03-003.H2098 Work Order: 11343606001 Page: 1a RFW Batch Number: 0303L932

Sample   RFW#:   SOIL   SOIL		Cust ID	: B16543	L	B16541	L	B16541	•	VBLKLM		VBLKLM BS		
Surrogate   Bromofluorobenzene   82   \$ 85	-	n Matrix D.F.	: SOIL	SOIL SOII 1.04 0.5		30	SOIL 0.98	0	SOIL 1.0	0	SOIL 1.0	0	
Recovery   1,2-Dichloroethane-d4		Toluene-d	8 100	8	98	ક	98	왕	98	%	97	8	
Chloromethane	Surrogate	Bromofluorobenzen		_	85	-	82	-	86	-	89	-	
Chloromethane	4				= =		= =		<del>-</del> -		= =	-	
Bromomethane				==f1	.===##===##	==f1		= <b>f</b> l	=========	=fl		=fl=	:=== <b>=</b> ====fl
Vinyl Chloride         11 U         10 U	Chlorometha	ane	11		10	-			10	U	10		
Vinyl Chloride         11 U         10 U	Bromomethar	ne	11	U	10	U	_•	_	10	U	10	U	
Methylene Chloride         10         7         7         5         U         1         J           Acetone         11         U         10	Vinyl Chlor	ride	11	_		-	_ ₩	-		-	10	_	
Methylene Chloride         10         7         7         5         U         1         J           Acetone         11         U         10	Chloroethar	ne	11	U		Ü		U		_		_	
Carbon Disulfide	Methylene (	Chloride	10		7		7			-	1	J	
1,1-Dichloroethene	Acetone		11	_		_	_ <del>-</del>			_		_	
1,1-Dichloroethane	Carbon Dist	ulfide	6	_	· <del>-</del>	_	=	_	=	_	=	-	
1,2-Dichloroethene (total)	1,1-Dichlor	roethene	6	_		•		-	_	•		-	
Chloroform 6 U 5 U 5 U 5 U 5 U 5 U 1,2-Dichloroethane 6 U 5 U 5 U 5 U 5 U 5 U 1,1-Trichloroethane 11 U 10	1,1-Dichlor	roethane	6	_		-	_	_	_	_		_	
1,2-Dichloroethane       6       U       5       U       5       U       5       U       5       U       5       U       10       U			_	_	=	_	_	_	<del>-</del>	_	<del>-</del>	_	
2-Butanone	_		<del></del> ·	_		_	_	_	-	•	_	_	
1,1,1-Trichloroethane       6       U       5				-	_	_	_	-	_	_	_	_	
Carbon Tetrachloride       6 U       5 U			11	_		_	= -	_	-	_	= =	_	
Bromodichloromethane         6         U         5         U         104         %         DU         DU <th< td=""><td>1,1,1-Trick</td><td>nloroethane</td><td> 6</td><td>_</td><td></td><td>_</td><td>_</td><td>_</td><td>_</td><td>_</td><td>_</td><td>-</td><td></td></th<>	1,1,1-Trick	nloroethane	6	_		_	_	_	_	_	_	-	
1,2-Dichloropropane	Carbon Teti	rachioride	6	_	-	_	_	_		_	_	-	
cis-1,3-Dichloropropene       6       U       5       U       5       U       5       U       5       U       104       %         Dibromochloromethane       6       U       5       U       10       <	Bromodichio	oromethane	6	_	_	_	=	_	<del>-</del>	_	<del>-</del>	_	
Trichloroethene       6 U       101 %       5 U       101 %       5 U       104 %         Dibromochloromethane       6 U       5 U       5 U       5 U       5 U       5 U         1,1,2-Trichloroethane       6 U       5 U       5 U       5 U       5 U       5 U         Benzene       6 U       98 %       98 %       5 U       104 %         Trans-1,3-Dichloropropene       6 U       5 U       5 U       5 U       5 U         Bromoform       6 U       5 U       5 U       5 U       5 U         4-Methyl-2-pentanone       11 U       10 U       10 U       10 U       10 U         2-Hexanone       11 U       10 U       10 U       10 U       10 U         Tetrachloroethene       6 U       5 U       5 U       5 U       5 U         1,1,2,2-Tetrachloroethane       6 U       5 U       5 U       5 U       5 U         Toluene       6 U       104 %       101 %       5 U       104 %	1,2-Dichlor	ropropane	6	_		_	_	_	_	_	_	-	
Dibromochloromethane       6 U       5 U       5 U       5 U       5 U         1,1,2-Trichloroethane       6 U       5 U       5 U       5 U       5 U         Benzene       6 U       98 %       98 %       5 U       104 %         Trans-1,3-Dichloropropene       6 U       5 U       5 U       5 U       5 U         Bromoform       6 U       5 U       5 U       5 U       5 U         4-Methyl-2-pentanone       11 U       10 U       10 U       10 U       10 U         2-Hexanone       11 U       10 U       10 U       10 U       10 U         Tetrachloroethene       6 U       5 U       5 U       5 U       5 U         1,1,2,2-Tetrachloroethane       6 U       5 U       5 U       5 U       5 U         Toluene       6 U       104 %       101 %       5 U       104 %	C1S-1,3-D10	cnioropropene		_		-	_	_		_		-	
1,1,2-Trichloroethane       6 U       5 U       5 U       5 U       5 U         Benzene       6 U       98 %       98 %       5 U       104 %         Trans-1,3-Dichloropropene       6 U       5 U       5 U       5 U       5 U         Bromoform       6 U       5 U       5 U       5 U       5 U         4-Methyl-2-pentanone       11 U       10 U       10 U       10 U       10 U         2-Hexanone       11 U       10 U       10 U       10 U       10 U         Tetrachloroethene       6 U       5 U       5 U       5 U       5 U         1,1,2,2-Tetrachloroethane       6 U       5 U       5 U       5 U       5 U         Toluene       6 U       104 %       101 %       5 U       104 %	Trichtoroe	cnene		_				_	-	_	_	-	
Benzene       6 U       98 %       98 %       5 U       104 %         Trans-1,3-Dichloropropene       6 U       5 U       5 U       5 U       5 U         Bromoform       6 U       5 U       5 U       5 U       5 U         4-Methyl-2-pentanone       11 U       10 U       10 U       10 U       10 U         2-Hexanone       11 U       10 U       10 U       10 U       10 U         Tetrachloroethene       6 U       5 U       5 U       5 U       5 U         1,1,2,2-Tetrachloroethane       6 U       5 U       5 U       5 U       5 U         Toluene       6 U       104 %       101 %       5 U       104 %	Dipromocnic	orometnane		-		_	_	-	•	_			
Trans-1,3-Dichloropropene       6 U       5 U       5 U       5 U       5 U         Bromoform       6 U       5 U       5 U       5 U       5 U         4-Methyl-2-pentanone       11 U       10 U       10 U       10 U       10 U       10 U         2-Hexanone       11 U       10 U       10 U       10 U       10 U       10 U         Tetrachloroethene       6 U       5 U       5 U       5 U       5 U       5 U         1,1,2,2-Tetrachloroethane       6 U       5 U       5 U       5 U       5 U       5 U         Toluene       6 U       104 %       101 %       5 U       104 %	1,1,2-Tric	nioroethane				-	_	_	=	_	_	_	
Bromoform       6 U       5 U       5 U       5 U       5 U         4-Methyl-2-pentanone       11 U       10 U       10 U       10 U       10 U       10 U         2-Hexanone       11 U       10 U       10 U       10 U       10 U       10 U         Tetrachloroethene       6 U       5 U       5 U       5 U       5 U       5 U         1,1,2,2-Tetrachloroethane       6 U       5 U       5 U       5 U       5 U       5 U         Toluene       6 U       104 %       101 %       5 U       104 %						-	- <del>-</del>	-	-	_	· ·	_	
4-Methyl-2-pentanone       11 U       10 U <td< td=""><td>Trans-1,3-</td><td>Dichioropropene</td><td> 6</td><td>-</td><td></td><td>_</td><td>_</td><td>-</td><td></td><td>-</td><td></td><td>_</td><td></td></td<>	Trans-1,3-	Dichioropropene	6	-		_	_	-		-		_	
2-Hexanone       11 U       10 U				_	<del>-</del>	_	_	_	_	•		-	
Tetrachloroethene       6 U       5 U       5 U       5 U       5 U         1,1,2,2-Tetrachloroethane       6 U       5 U       5 U       5 U       5 U         Toluene       6 U       104 %       101 %       5 U       104 %						-		_	_ ·	_	_ <del>-</del>	_	
1,1,2,2-Tetrachloroethane6 U 5 U 5 U 5 U 5 U 5 U Toluene6 U 104 % 101 % 5 U 104 %	2-Hexanone			_		_		_		_	_ <del>-</del>		
Toluene 6 U 104 % 101 % 5 U 104 %	retrachior	traghlereethane	<u> </u>	_		_		_		-	_	_	
10140		craciitoroecilane				_	_	-		•			
		of BDA CID OC linit-		U	104	- 15	101	15	5	U	104	15	

RFW Batch Number: 0303L93	2 Clien	t: TNU-	HANFORI	F03-00	3	Work O	rde	r: 1134360600	1 Page: 1	<u>b</u>	
	Cust ID:	B16541		B16541		B16541	•	VBLKLM	VBLKLM BS		~
	RFW#:	001		001 MS	}	001 MSD	)	03LVH048-MB	03LVH048-	MB1	\
Chlorobenzene		6	U	103		100	<u>۽</u>	5 t	106	<u>*</u>	
Ethylbenzene		6	U	5	U	5	Ū	5 t	5	Ü	
Styrene		6	U	5	U	5	U	5 t	5	U	
Xylene (total)		6	Ū	5	Ŭ	5	U	5 t	5	U	

<sup>\*=</sup> Outside of EPA CLP QC limits.

Lionville Labor	atory L	se Only	Custo	dy Ira	nste	er 1	160	UI U/L	.av	** •	"		<b>~</b>		<del>-</del>	<b>5-</b>					6 Z	V	, ,	,
03031	93	7		FIELD PER	SONNE	L: C	OMPLE	TE ONL	Y SHAD	ED A	REA	s C_		G		•	=		F	G-		, .	BORATORY II	NC.
Client T7	JU-	HANFOL	D SAF	# F03-	003		Retrige	rator #		1	6			6			6		6	6			To the second	<u> </u>
Est. Final Pro	j. Samp	oling Date					#/Type	Container	Liquid															_
Project #		11343-	606-0	101-9999-	00				Solid	LAG	IAG	ING		AL		}	IAG-		IAG	IAG		<del></del>		
Project Conta	ct/Pho	10 #		70			Volume	:	Liquid	357	250	250		200			590		500	10				_
Lionville Labo	oratory	Project Mana	ager	30 dau		<del></del>	Presen	vatives	30114	1000	000	730		250						-		<del></del>		_
QC JIEC	<del>-</del>	Del	TAT_		Ľ	==:			<del></del>		ORG	ANIC		ALK				RG	τ¢	PH				
Date Rec'd	3-1	3-03	Date Due	4-12	-03		REQUE		-	βŞ	BNA	<b>1</b> 8 8	Herb	El Gr Keidai			Meta Isa	3	ANI QU					
MATRIX		}				itrix					<del></del>	<del></del>	J	<del></del>	Lionvi	le La	borate				Ţ		<del></del>	_
CODES: S - Soil SE - Sediment SO - Solid	Lab ID		Client ID/Desc	ription	Cho (c	2C osen ✓) MSD	Matrix	Date Collected	Time Collected	H + 190	0625 x	090		OGESC			925 ¥51€		1MORGO	HOT				
SL - Studge W - Water O - Oil	001	B165	41		1,/	7	3	3-11-05	1045								1	To	<del>                                     </del>	1				_
A - Air																			<u> </u>					
DS - Drum Solids DL - Drum											<u> </u>	ļ						<u> </u>	<u> </u>	<b></b>		<b> </b>		
Liquids L - EP/TCLP							ļ	ļ	ļ	<del>  </del>	ļ	ļ						}	ļ	<b> </b>	<b>  </b>			
Leachate Will - Wipe		<u> </u>					<b> </b>	<del> </del> -		<b>├</b>		<del> </del> -			<del>                                     </del>					├	<b> </b>	<del> </del>		_
X - Other F - Fish	<b> </b>	<b></b>				<b> </b> -	<del> </del>	<del> </del>	<del> </del>	┼	<del> </del>	-			├				├	<del> </del>		<del>   </del>		_
		<del></del>				<del> </del> -	<del> </del>	<del> </del>	<del> </del> -	┼	<b>├</b> -			-	<del>{</del> }			<del>                                     </del>	<del> </del>	<del></del>				_
	}	<b></b>					ļ	<del> </del>	<del> </del>	<del> </del>	<del> </del>		<del> </del>					<del>                                     </del>	<del>                                     </del>	<del> </del>				
	<b> </b>	<del> </del>				<del> </del>	<del> </del>	<del> </del>	<del> </del>	†	-	<del> </del>	<b> </b>		11		 		1-					_
Special Instruc	lons:	SAF	# F0:	3-003	L	DATE	REVISION	NS: As, B	a.Cd.	Cr. P	6. So	Ag	Be	.Cu.	Ni V	Zn.H		amoles	Lionvi	<del>-,</del>		Use On	nly stant Seal w	== 
						TNO	460	2. (CCL,	icfl, (	CN03.	ICNO	<u>z , k</u>	104	. 1Cs	04, 11	V3 N	) H	Shippe	ed	_ Of	1) Pa	Present ckage/	On Outer Y or N an on Out	Į Į
<u> </u>								3. (V)H3	in to	יטי ער	1 <u>L</u>	300					`  ⊋	el	Bel	1	Pa	ickage (	Y) or N	1
{								4											int or <u>@</u> ved <u>i</u> n (		3)	Present (	on Samp	ek V
								5									-   C	ondition	۰ <i>(0)</i> ه	r N		Unbroke		
				<del></del>		==		6			<del></del>	<del></del>				==	P	Sample roperty	Preser				or N ord Prese	
Relinquished	3	Received by	Date	Time	Relinqui by			Received by		Date	l	ne	Sam	iples La	ies Betw abels and	ı	51	Recei	o (Y) ved Wit		Up	ion Sam	ple Rec't (Ŷ`)or I	N
FUE		. Wend	7/3/03	0955	C	O::::O	SIE	E	REV	IIDI Yor	<b>⊥</b>		COC	Reco	rd? Y o	' O	Н	olding	Times	or N		ooler emp	<u>.3.</u> •	С
1		,	2	11					115	1/1	3 6	•17	77	100	290	<u>~ c</u>	74	46				<del></del>		_

FH-Central Plateau	ı Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								·	F03	-003-155	Page 1	of 1	
Collector Fahlberg/Johansen/Thomas		Comp	any Contact Cearlock	Telepho 373-3	ne No.					t Coordin	etor	rice Code	8N		rnaround
Project Designation 200 Area Source Characterizat	ion 200-CS-1 OU - Soi		ling Location choic B8828 (100-102 ft)	)					SAF N F03-00		A	ir Quality		45]	Days 5
ice Chest No.	11-025		Logbook No. F-N-3251				3-6-03 -118322			d of Ship ral Expre					
Shipped To EBERLINE SERVICES (Form		Offsit	Offsite Property No. F7030 164  Bill of Lading/Air Bill No							790	3746				
POSSIBLE SAMPLE HAZAF	RDS/REMARKS		Preservation	Cool 4C	Cool 4	4C	Cool 4C	Cool	4C	None	None	None	None	None	
T: To TS	5 XMJ		Type of Container	аG	aG		aG	aG	)	аG	aG	aG	aG	29	
C00/4			No. of Container(s)	1 250mL	250m		1 250mL	250n		1 500mL	1 500mL	1 <u>mg ව</u> ්ට ස්ථ <del>-125mt</del>	1000mL	71 7125mL	
			Volume									Leome		2	
	SAMPLE ANAL	YSIS		VOA - 8260A (TCL)	See item ( Specia Instruction	ألما	Alcohols, Glycols, & Ketones - 8015M (Add- on) [1- Propanol, Ethanol]	PCBs -	J	item (2) in Special structions.	See item (3) is Special Instructions.	pH (Soil) - 9045	See item (%in Special Instructions	Nickel-63; Technetium- 99; Tritium - H3	
Sample No.	Matrix *	Sample Date	Sample Time								25 / 20 - 37 · .				
B16541	\$OIL.	3-11-03	1045	X	X	_	X_	×		×	×	<del>  X</del>	/		
					1-	-			_		- <u>-</u>				-
CHAIN OF POSSESSION	<u> </u>	Sign/Prin	t Names	<u> </u>	 	PECI	AL INSTR	UCTIO	SNC			<u> </u>	L	L	Matrix *
Relinquished By/Removed From	ate/Time 3/11/03 ate/Time 12 11:03 ate/Time ate/Time ate/Time	1230	Lab rep D analyze (1) Sen (2) ICF ICP Me 7471 - (3) IC Ammor (4) Gre 154, Eu Isotopic	ysis. FH acknown provided the performance of the pe	as a TIC cowledges 4 hr of re 70A (Ad 10A (Supertra ium Hex 0 (Chlor otal Cyar oss Beta ; Gamma horium-2	if detectal that the heccipt. Id-On) (To pertrace) { ace Add-C - 7196 ride, Fluor nide - 901 ; Camma a Spec - A 132}; Isoto	ributyl phoe Arsenic, Baron) (Beryll ride, Nitrate 0; Sulfides Spectrosco dg-on (Am	sphate}; TPF arium, Cadm ium, Copper, c, Nitrite, Pho - 9030 by {Cusions- iericium-241;	d kerosene range by EPA 300.0 of I-Diesel Range ium, Chromium Nickel, Vanad osphate, Sulfate 137, Cobalt-60, Radium-228; inr-241, Neptuni	wTPH-D , Lead, Selenium, Zinc}; Me ); NO2/NO3 -  Europium-152 Isoopic Pluton um-237; Stront	m, Silver}; reury - 353.2; -Buropium- num; ium-	S=Soil SE-Sedimen SO-Solid SI-Studge W = Water O-ONI A=Air DS-Druna Liquids T-Tissue WI-Wipe D-Time VI-Sedimen 2-Ohero			
FINAL SAMPLE Disposal Met DISPOSITION	thod						Dispo	sed By					I	Date/Time	

# LIONVILLE LABORATORY INCORPORATED

SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFOLD

Purchase Order/Project:

DATE: 3-13-03

SAF#/ SOW# / Release #: F03 -003

Laboratory SDG #: 0303L 932

TE:	ALL ENTRIES MARKED "NO" MUST BE E	XPLAINED II	THE COMM	ENT SECTION	1.
1.	Custody seals on coolers or shipping container intact, signed and dated?	□ Yes	. D №	D N/A	☐ see Comment i
2.	Outside of coolers or shipping containers are free from damage?	©r'Yes	□ No	D N/A	See Comment
3.	Airbill # recorded?	E Yes	□ N₀	□ N/A	See Comment
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	Ø Yes	□ N <sub>0</sub>	מאים	🗆 sec Comment
5.	Sample containers are intact?	Dr ves	D No	□ N/A	☐ see Comment
6.	Custody seals on sample containers intact, signed and dated?	<b>□</b> Yes	□ No	□ N/A	D see Commen
7.	All samples on coc received?	12 Yes	□ No	A/A	see Commen
8.	All sample label information matches coc?	Q Yes	□ N <sub>0</sub>	□ N/A·	see Commen
9.	Laboratory QC samples designated on coc? (QC stickers placed on bontles?)	ĎΥes	□ No	D N/A	D see Commen
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	D/es	□ No	□ N/A	□ see Commet
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	D-N/A	□ see Comme
12.	coc signed and dated?	E Yes	D No	□ N/A	see Comme
13.	coc will be faxed or emailed to client?	E Yes	□ No	D N/A	□ see Comme
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	r ⊃ Yes	□ No	D N/A	🗆 see Comme

Cooler # / temp (°C) and Comments:

ERC-01-025

Laboratory Sample Custodian:

Laboratory Project Manager:

# Lionville Laboratory, Inc. BNA ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03

LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541	001	s	03LE0295	03/11/03	03/14/03	04/01/03
B16541	001 MS	s	03LE0295	03/11/03	03/14/03	04/01/03
LAB QC:						
SBLKPI	MB1	s	03LE0295	N/A	03/14/03	04/01/03
SBLKPI	MB1 BS	s	03LE0295	N/A	03/14/03	04/01/03





Client: TNU-HANFORD F03-003

LVL#: 0303L932

**SDG/SAF** # H2098/F03-003

W.O. #: 11343-606-001-9999-00 **Date Received:** 03-13-2003

### **SEMIVOLATILE**

One (1) soil sample was collected on 03-11-2003.

The sample and its associated OC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 03-14-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-01-2003.

The following is a summary of the OC results accompanying the sample results and a description of any problems encountered during their analyses:

- All results presented in this report are derived from a sample that met LvLI's sample acceptance 1. policy.
- The sample was extracted and analyzed within required holding time. 2.
- 3. Non-target compounds were detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All blank spike recoveries were within EPA QC limits.
- 6. All matrix spike recoveries were within EPA QC limits. The extract of matrix spike duplicate was lost during storage due to the cracked vial; consequently, the matrix spike sample has been analyzed and reported. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
- 7. Internal standard area and retention time criteria were met.
- 8. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor

President

Lionville Laboratory Incorporated

som\gorup\data\bna\tnu-hanford-0303-985.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 3 pages.

Lionville Laboratory Samp	ie Discrepancy Report	SDR#:_(	03M543
	ch: <u>0303C93Z</u> nples: <u>001T</u> hod: <u>SW849MCAWW/CLP/</u>		
Note*: Verified by [Log-In] or [Prep Group] (circle)sign  c. Problem (Include all relevant specific resu  Extract Vial Was Cracked:	r Wrong Test Code On r Broken Wrong San nt Sample Preservation nable to Analysis nature/date: Its; attach data if necessary)	nple Pulled Label II on Wrong Receive	D's Illegible ed Past Hold
2. Known or Probable Causes(s)			
3. Discussion and Proposed Action Re-log Entire Batch Following Samples: Re-leach Re-extract Re-digest Revise EDD Change Test Code to Place On/Take Off Hold (circle)  4. Project Manager Instructionssignature/dat Concur with Proposed Action Disagree with Proposed Action; See Instance Include in Case Narrative Client Contacted; Date/Person	ie: Muthal 4/1	port ms and BS	
Add Cancel 5. Final Actionsignature/date:	Other Explan	ation:	
Verified re-[log][leach][extract][digest][aha Included in Case Narrative Hard Copy COC Revised Electronic COC Revised EDD Corrections Completed When Final Action has been recorded, forw		distribution and filing.	l
Route Distribution of Completed SDR  X Initiator X Lab General Manage X Project Mgr: Ston Johnson Haslet X Technical Mgl: We son/Daniels X QA (file) Data Management: Feldman Sample Prep: Beegle/Kiger	Route Distributi  Metal: Inorga GC/L0 MS: R Log-ir	on of <u>Completed</u> SDR s: Beegle nic: Perrone c: Kiger ychlak Layman : Melnic : Soos	

# **GLOSSARY**

#### DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- j = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



4

# **GLOSSARY**

# **ABBREVIATIONS**

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.



5

#### TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP Missed Peak: manually added peak not found by automatic quan program.
- PA Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



#### Lionville Laboratory, Inc.

Client: TNUHANFORD F03-003 H2098

RFW Batch Number: 0303L932

Semivolatiles by GC/MS, Special List

Report Date: 04/02/03 16:12

Page: la

Work Order: 11343606001

Cust ID: B16541 B16541 SBLKPI SBLKPI BS Sample RFW#: 001 001 MS 03LE0295-MB1 03LE0295-MB1 SOIL SOIL SOIL SOTE Information Matrix: D.F.: 1.00 1.00 1.00 1.00 Units: uq/Kq ug/Kg ug/Kg uq/Kq ş Nitrobenzene-d5 75 ş 85 왐 82 옿 83 2-Fluorobiphenvl 81 왐 90 왕 85 왕 89 왐 Surrogate p-Terphenvl-d14 102 왕 111 왐 112 옿 111 왐 Recovery Phenol-d5 옿 ş 71 83 81 옿 79 2-Fluorophenol 73 85 왐 78 옿 78 앟 2,4,6-Tribromophenol 왕 89 82 96 84 옿 \_\_\_\_\_\_ 350 IJ 79 왕 330 U 73 Phenol bis(2-Chloroethyl)ether 350 U 330 U 330 U 350 U 2-Chlorophenol 82 330 U 76 옿 350 U 윻 1,3-Dichlorobenzene 350 U 350 U 330 U 330 U 1,4-Dichlorobenzene\_\_\_\_ 350 U 75 옿 330 U 74 ş 1.2-Dichlorobenzene\_\_\_\_ 350 U 350 U 330 U 330 U 2-Methylphenol 350 U 350 U 330 U 330 U 2,2'-oxybis(1-Chloropropane) 350 U 350 U 330 U 330 U 3- and/or 4-Methylphenol 350 U 350 U 330 U 330 U N-Nitroso-Di-n-propylamine 350 U 84 왉 330 U 78 ¥ 350 U Hexachloroethane 350 U 330 U IJ 330 Nitrobenzene \_\_\_\_\_ 350 U 350 U 330 U 330 U Isophorone 350 U 350 U 330 U 330 U 350 U 350 U 330 U 330 U 350 U 350 U 330 U 330 U bis(2-Chloroethoxy)methane\_\_\_\_\_ 350 U 350 U 330 U 330 U 2,4-Dichlorophenol 350 U 350 U 330 U 21 J 1,2,4-Trichlorobenzene 350 U 78 왐 330 U 76 ş 350 U Naphthalene 350 U 330 U IJ 330 4-Chloroaniline 350 U 350 U 330 U 330 U 350 U Hexachlorobutadiene 350 U 330 U 330 U 4-Chloro-3-methylphenol\_\_\_\_ 350 U 82 왐 330 U 77 옿 2-Methylnaphthalene 350 U 350 U 330 U 330 U Hexachlorocyclopentadiene\_\_\_\_ 350 U 350 U 330 U 330 U 2,4,6-Trichlorophenol 350 U 350 U 330 U 330 U 2,4,5-Trichlorophenol 860 U 860 U 840 U 840 U \*= Outside of EPA CLP QC limits.

Work Order: 11343606001

Page: 1b

Cust ID: B16541 B16541 SBLKPI SBLKPI BS RFW#: 001 001 MS 03LE0295-MB1 03LE0295-MB1 2-Chloronaphthalene\_\_\_\_\_ 350 U 350 U 330 U 330 U 2-Nitroaniline\_\_\_\_ 860 U 860 U 840 U 840 П Dimethylphthalate\_\_\_\_\_ 350 U 330 350 U U 330 П Acenaphthylene 350 U 350 U 330 U 330 U 2,6-Dinitrotoluene\_\_\_\_ 350 U 350 U 330 U 330 U 3-Nitroaniline 860 U 860 U 840 840 U U Acenaphthene\_\_\_\_\_ 350 U 82 옿 330 IJ 왉 81 2,4-Dinitrophenol 860 U 860 U 840 U 840 IJ 4-Nitrophenol\_\_\_\_\_ 860 U 88 옿 840 U 92 왐 Dibenzofuran 350 U 350 U 330 U 330 U 2,4-Dinitrotoluene 350 U 78 왕 330 U 76 8 Diethylphthalate\_\_\_\_\_ 350 U 350 U 330 U 330 U 4-Chlorophenyl-phenylether\_\_\_\_ 350 U 350 U 330 U 330 IJ Fluorene\_\_\_\_ 350 U 350 U 330 U 330 U 4-Nitroaniline\_\_\_\_\_ 860 U 860 U 840 U 840 U 4,6-Dinitro-2-methylphenol\_\_\_\_ 860 U 860 U 840 U 840 U N-Nitrosodiphenylamine (1)\_\_\_\_\_ 350 U 350 U 330 U 330 U 4-Bromophenyl-phenylether\_\_\_\_ 350 U 350 U 330 Ū 330 II Hexachlorobenzene 350 U 350 U 330 U 330 II Pentachlorophenol\_\_\_\_\_ 860 U 84 ş 840 II 85 ş Phenanthrene\_\_\_\_\_ 350 U 350 U 330 U 330 U Anthracene\_\_\_\_\_ 350 II 350 U 330 U 330 U Carbazole 350 U 350 U 330 330 U U Di-n-Butylphthalate\_\_\_\_\_ 44 J 350 U 330 U 330 U Fluoranthene 350 U 350 U 330 U 330 U Pyrene 350 U 100 왐 330 U 100 ş Butylbenzylphthalate 350 U 350 U 330 U 330 U 3.3'-Dichlorobenzidine\_\_\_\_ 350 U 350 U 330 U 330 U Benzo(a) anthracene\_\_\_\_\_ 350 U 350 U 330 U 330 U Chrysene 350 U 350 U 330 U 330 U bis(2-Ethylhexyl)phthalate\_\_\_\_ 350 U 350 U 330 U 330 U Di-n-Octyl phthalate\_\_\_\_\_ 350 U 350 U 330 U 330 TT Benzo(b) fluoranthene\_\_\_\_\_ 350 U 350 U 330 U 330 U Benzo(k)fluoranthene\_\_\_\_\_ 350 U 350 U 330 U 330 U Benzo(a)pyrene\_\_\_\_\_ 350 U 350 U 330 U 330 IJ Indeno(1,2,3-cd)pyrene\_\_\_\_ 350 U 350 U 330 U 330 U Dibenzo(a,h)anthracene\_\_\_\_ 350 U 350 U 330 U 330 U Benzo(g,h,i)perylene\_\_\_\_ 350 U 350 U 330 U 330 U Tributylphosphate 350 U 330 U 350 U 330 U (1) - Cannot be separated from Diphenylamine. \*= Outside of EPA CLP QC limits.

#### 1 F

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	CLIENT	SAMPLE	NO.		
ı.		·		<u>-</u> -	
_ i:	B16541				

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-003 H2098

Matrix: (soil/water) SOIL Lab Sample ID: 0303L932-001

Sample wt/vol: 30.0 (g/mL)  $\underline{G}$  Lab File ID:  $\underline{A040113}$ 

Level: (low/med) LOW Date Received: 03/13/03

% Moisture:  $\underline{\phantom{a}}$  decanted: (Y/N) Date Extracted:  $\underline{03/14/03}$ 

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/01/03

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N)  $\underline{N}$  pH:  $\underline{\phantom{0}}$  CONCENTRATION UNITS:

Number TICs found: 3 (ug/L or ug/Kg) 2 ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
_======================================	~=====================================		===========	=====
1.	ALDOL CONDENSATE	5.823	100	JAB
2.	ALDOL CONDENSATE	6.376	10000	JAB
3. 79-34-5	1,1,2,2-TETRACHLOROETHANE	7.832	90	JNB
1				İ

#### 1 F

## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	CLIENT	SAMPLE	NO.	
1-				
	<b>ев</b> т. <b>И</b> ВТ			

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-003 H2098

Matrix: (soil/water) SOIL Lab Sample ID: 03LE0295-MB1

Sample wt/vol: 30.0 (g/mL)  $\underline{G}$  Lab File ID:  $\underline{A040111}$ 

Level: (low/med) LOW Date Received: 03/14/03

% Moisture: \_\_\_\_ decanted: (Y/N)\_\_ Date Extracted: 03/14/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/01/03

Injection Volume: 2.0(uL) Dilution Factor: 1.00

Different volume. 2.3 (up)

GPC Cleanup: (Y/N) N pH:  $\underline{7.0}$  CONCENTRATION UNITS:

Number TICs found: 3 (ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
				====
1.	ALDOL CONDENSATE	5.828	100	JA
2.	ALDOL CONDENSATE	6.380	10000	JA
3. 79-34-5	1,1,2,2-TETRACHLOROETHANE	7.829	90	JN
<b>!</b>		l!	1	

Lionville Labo	ratory	Use Only	C	usto	dy T	ran	sfe	er F	Rec	ord/L	_ab	Wc	rk	Re	au	les	<b>t</b> Pac	ae ·	, of	1		ê v	₹ ■	۔ ۔ا	, <b>a</b> .	,
0303	193	32								TE ONL				S	7	G					- -	G	F C	ONVILLE	ABORATO	RY INC.
Client	vu-	HAUF	ol D	SAF	# Fo	3-00	13		Refrige	rator #		1	6	6		6		寸	6		6	6				
Est. Final Pro		- <del>-</del>		<u> </u>		<u> </u>	<u> </u>				Liquid	_						-†								
Project #				06-0	01- 99	9.00	)		#/Type	Container	Solid	140	IAG	IV.		IAL		_	46		1AG-	IAG				
Project Cont					· · · · · · · · · · · · · · · · · · ·						Liquid	11.25	1	17,0					7		1/20					_
Lionville Lab					07	-			Volume	•	Solid	252	250	250		250			250		500	40				
OC SPEC					30	days		<del>.          </del>	Preserv	/atives	1	-	-						_		_	-				
								==					7	ANIC	_	ALK		一	INO	RG	TC.	PH				
Date Rec'd _	3.	13-03		Date Due	4.	-(2-0	3		REQUE		<b>-&gt;</b>	ģş	BN A A	PCB	Heit	Keish Keish		F	76 Balan	S	*Ni Qu					
MATRIX	}	Ì						trix		}	1	<u> </u>			<del> </del>		Lionvill	ie Lab	orato	ry Us	e Ont	y	<u>t</u>		-	
S - Soil SE - Sediment SO - Solid	Lab ID	, }	Clie	nt 1D/Desci	iption		Cho	iC isen /)	Matrix	Date Collected	Time Collected	H 729	0625 X	0/12		965 C			0 13 2 2 3		JAORG.	H) dI	ļ			
SL - Sludge	<b></b>	+		<del></del>			MS	MSD				우	-	0		Ō	<del> </del> -		<b>₹</b>		*	ļ_` <u>`</u>				
W - Water O - Oil	001	B16	54	<u> </u>			1		5_	3-11-03	1045	┸┸						}		75	1					
A - Air DS - Drum	<u> </u>						<b> </b>			ļ		<u> </u>	ļ			ļ					<u> </u>	<u> </u>				
Solids DL - Drum	L_				<u> </u>							<u> </u>	<u> </u>								Ĺ	<u> </u>				
Liquids L - EP/TCLP	<u> </u>									<u> </u>		<u></u>	<u> </u>			<u> </u>						!				
Leachate WI - Wipe													<u> </u>	_							<u></u>					- 
X - Other					<del></del>																					
F - Fish																										
	-				<del></del>							<del>                                     </del>	<del>                                     </del>													
-							<del> </del>	<u> </u>		†	L		<del>                                     </del>													
Careful Institut							<u>.                                    </u>	DATE/	REVISION	NS: 0 0	·		, -		^		1/				Lionvi	le Labo	oratory	Use O	nly	
Special Instruc	tions:	51	9 F *#	F03	,-003			TNO	6 O	1. As, β	a.Cd.( icFL, (C	Lr. Y. W03.	10NO	, <i>H</i> g 2 , IC	. Ве РОЧ	Cu.	<u>Ni, V, Z</u> 04, 1N	n.H3  3 N Z	(1)	Shippe	were:	, or	1)	nper Res Presen ckage/	oq Ou	ter
										3. [NH3	N. IC	NTO	L	FD						bill#_	RI	1	2)	Unbrok	en on (	Outer
										4		-	_						2)	Ambier	nt or RI	hilled		ckage ( Presen	_	
)																			3)	Receiv	ed <u>i</u> n G	lood	,		Y or	
1										5									1	ndition Sample	<i>(0)</i> •	r N		Unbrok		<b>N</b> I
										6	<del>- 1-</del>		<del> </del>							openy l	Preserv		CC	mple/ C Reci	ord Pres	sent
Relinquishe by	d	Receive by	ed	Date	Time	Rel	linqui: by	shed		Received by	1	ate	Tim	ne l			es Betwe bels and		<b>.</b>		60 (A)		Up	on Saπ	ple Re	c't
CÕE		1/a/	-0	3/3/03	God		C	קייינ	SITE		UR	GI	IAL,		COC	Recon	d? Y or	Ø		Hecelv Iding T				oler	<u>پ</u>	
r. wee		<u> </u>	7	<u> 2017  </u>	0955			-WA	3 E	<del></del>	REV	VR1	TE	N	79	02 Z	3.90é	33	74	6	(y) o	r N	Тө	mp[	· <u>&gt;</u>	.°C 

Relinquished by	Received by	Date	Time
WAS	7 E	URIGIN	
	ŀ	EWRI	IEN

FH-Central	l Plateau Project		HAIN OF CUST	ODY/S	AMPI	LE A	ANALY	/SIS	RF	EQUEST		F03	-003-155	Page 1	of 1
Collector Fahlberg/Johansen/	Thomas	Com	pany Contact Cearlock	Telepho 373-3	ne No.				Pro	oject Coordin ENT, SJ	etor	rice Code	8N	Data Tur	naround
Project Designation	haracterization 200-CS-1 OU - S	Sam	pling Location prehole B8828 (100-102 ft)	)						F No. 3-003	A	ir Quality		45 I	Days 2
Ice Chest No.	201-025		Logbook No. NF-N-3251				3-6-03 118322			thod of Ship Federal Expre					•
CL!AT.	TCES (Formerly TMA) REC	en Offs	te Property No.	30 1/	64				Bil	ll of Lading//	Air Bill No	790	<u>z</u> 2	2902	3746
	LE HAZARDS/REMARKS		Preservation	Cool 4C	Cool 40	ic	Cool 4C	Cool	4C	None	None	None	None	None	
T: T	o TSJ5 XMJ and/or Storage		Type of Container	aG	aG		аG	aC	3	aG	aG	aG	аG	25/	
	200/4°C		No. of Container(s)	1	1		1	1		1	1	ე <u>იპ</u>	1	8	
			Volume	250mL	250mI	ı.	250mL	250		500mL	500mL	125mt	1000mL	7125mL	
	SAMPLE ANA	ALYSIS		VOA - 8260/ (TCL)	A See item (1 Special Instruction	ons.	Alcohols, Glycols, & Ketones - 8015M (Addon) (1- Propanol, Ethanol)	PCBs -	8082	See item (2) in Special Instructions.	See item (3) i Special Instructions	9045	See item (%in Special Instructions	Nickel-63; Technetium- 99; Tritium - H3	
Sample No	. Matrix *	Sample Date				·					 				
B16541	SOIL	3-11-03	1045	X	X	_		×		×	×	X	<del>/                                    </del>		
												<del>                                     </del>	<del>                                     </del>		
				ļ <u>.</u>											
															Matrix *
Relinquished By/Remove 3 13 37 2 K Relinquished By/Remove V COO Rethod Sy/Remove Relinquished By/Remove Relinquished By/Remove	defrom FH Date/Time    Date/Time   Date/Ti	Received By/S	Refulber D D Torred In D D D D D D D D D D D D D D D D D D	ate/Time 3/11/03 ate/Time 12/11/03 ate/Time 4/1-03 ate/Time ate/Time ate/Time	1230 A A A (1) (1) (2) (3) (4) (4)	ab repo D analyse Analyze (1) Sem (2) ICP ICP Met (4) IC A Ammoni (4) Gree (5) Stopic	sis. FH acknown pH within 2 mi-VOA 82 Metals - 60 tals - 6010A CV); Chrom Anions - 300 in a - 350.3; The see Alpha, 61	as a TIC owledge 4 hr of r 270A (A 10A (Su (Supertrium Hex 0 (Chlc otal Cya ross Bett ; Gamm horium	dd-On pertra race A c - 715 oride, l anide - a; Gar na Spe 232);	tectable, and rej the holding time it.  n) {Tributyl pho ace} {Arsenic, B Add-On) {Beryll 96 Fluoride, Nitrate - 9010; Sulficate - 9010; Sulficate ice - Add-On {An i, Isotopic Uranti	e for Nitrate sphate}; TPl arium, Cadn ium, Copper e, Nitrite, Ph - 9030	H-Diesel Range nium, Chromium Nickel, Vanad osphate, Sulfate	- WTPH-D n, Lead, Seleniu lium, Zinc}; Mo s); NO2/NO3 - ; Europium-132; Isotopic Pluto	um, Silver); ercury - 353.2; ;; Europium-	S-Soil SE-Sodiment SC-Solid SI-Shudge W = Water O-Oil A-Air DS-Drum Liquids T-Tissue Wi-Wipe VV gettation
LABORATORY SECTION	Received By													Date/fime	
FINAL SAMPLE DISPOSITION	Disposal Method						Dispo	sed By				·········		Neto Luic	

## LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFOLD

Purchase Order/Project:

DATE: 3-13-03

SAF#/ SOW# / Release #: F03 -043

Laboratory SDG #: 03031932

NOTE:	ALL ENTRIES MARKED "NO" MUST BE I	EXPLAINED I	THE COMM	ENT SECTION	₹
1.	Custody seals on coolers or shipping container intact, signed and dated?	D. Yes	D No	D N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	GP Yes	□ No	□ N/A	☐ see Comment #
3.	Airbill # recorded?	₽ Yes	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	Ø Yes	□ No	□ N/A	□ see Comment #
5.	Sample containers are intact?	to yet	□ No	□ N/A	☐ see Comment #
<b>6.</b>	Custody seals on sample containers intact, signed and dated?	<b>□</b> Yes	□ No	□ N/A	see Comment #
7.	All samples on coc received?	Te Yes	□ No	□ N/A	see Comment#
8.	All sample label information matches coc?	Ves	□ No	□ N/A·	☐ see Comment#
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	Ú Yes	□ No	□ N/A	see Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DX:es	□ No	□ N/A	see Comment #
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DANIA	☐ see Comment #
12.	. coc signed and dated?	E Yes	□ No	□ N/A	see Comment #
13.	. coc will be faxed or emailed to client?	E Yes∗	□ N <sub>0</sub>	□ N/A	see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

:RC01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

13

# Lionville Laboratory, Inc. GCSC ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541	001	S	03LE0349	03/11/03	03/24/03	03/25/03
B16541	001 MS	S	03LE0349	03/11/03	03/24/03	03/25/03
B16541	001 MSD	S	03LE0349	03/11/03	03/24/03	03/25/03
LAB QC:						
BLK	MB1	s	03LE0349	N/A	03/24/03	03/25/03
BLK	MB1 BS	s	03LE0349	N/A	03/24/03	03/25/03
BLK	MB1 BSD	S	03LE0349	N/A	03/24/03	03/25/03







Analytical Report

Client: TNU HANFORD F03-003

LVL#: 0303L932

SDG/SAF#: H2098/F03-003

W.O.#: 11343-606-001-9999-00

Date Received: 03-13-03

#### GC SCAN

One (1) soil sample was collected on 03-11-03.

The sample and its associated QC samples were prepped on 03-24-03 and analyzed on 03-25-03 according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures based on method 8015B for n-Propyl Alcohol and Ethanol.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 2. All required holding times for analysis have been met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. Surrogates are not currently employed in the methodology.
- 5. All blank spike recoveries were within acceptance criteria.
- 6. All matrix spike recoveries were within acceptance criteria.
- 7. All initial calibrations were within acceptance criteria.
- 8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels ()

Láboratory Manager

Lionville Laboratory Incorporated

r:\group\data\gcsc\03L-932.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.



### GLOSSARY OF GC SCAN DATA

## **DATA QUALIFIERS**

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

#### **ABBREVIATIONS**

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



## **GLOSSARY OF GC SCAN DATA**

- P = This flag is used for an GC SCAN target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC SCAN.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 04/02/03 09:57

Client: TNUHANFORD F03-003 H2098 Work Order: 11343606001 Page: 1 RFW Batch Number: 0303L932 BLK BS BLK BSD BLK B16541 B16541 B16541 Cust ID: 03LE0349-MB1 03LE0349-MB1 03LE0349-MB1 001 MS 001 MSD 001 RFW#: Sample SOIL SOIL SOIL SOIL SOIL Matrix: SOIL Information 1.00 1.00 1.00 1.00 1.00 D.F.: 1.00 mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg Units: 96 25 U 92 왐 93 26 U 90 n-Propyl Alcohol 왕 25 U 104 % 107 106 ջ 26 U 102 왕 Ethanol

Je Je

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

Lionville	Labora	atory U	lse Only	C	usto	dy T	ran	ste	er f	Rec	ora/L	ap ,	<b>VV</b> ()	ıĸ	UC	qи	CJ	⊾ ra	.ye	0,			<b>1</b> 1.	2 =	1/		
030	031	93	2	·		FIELD	PERSO	ONNE	L: C	OMPLE	TE ONL	Y SHAD	ED A				~								ONVILLE	BORATOR	RYING
				-0>	- 4 5								A_	5	<u>c</u>	<del></del> -	D		<del>}</del>	E,		E	G-				
ĺ		-	HANFO		SAF	# 1-0	3-00	13		Refriger	rator #	Liquid	<del>                                     </del>	9	-		6					6	6				
Est. Fir	nal Pro	j. Samp	ling Date		2/ 0	A : 0=	00 00	`		#/Type	Container	<b> </b>		14/	***							IAG	IAG-			<del>  </del>	
ł			(1342		<u> </u>	01- 44	4 4- DU					Liquid	IAG	iAC	(AG-	{	AL			146		AG	000				<del> </del>
Į į			ne #			03	<u> </u>			Volume	•		250	aso	250		250			590		500	40				
LIONVII	IE LADO	STREET	Project Ma	ムク suades	TAT	30	chu.		<del>;</del>	Preserv	atives	1			_					-		_	-				
<u> </u>			Del	<u></u>	<u> </u>			===						ORG			ALK			INC	RG	TC	PH				
Date Re	ec'd	3-1	3-03	D	ate Due	4	-(2-0	3		REQUE		<b>-</b>	βŞ	BNA	PCB	Herb	ery)			Melai	S	AN GL					
MATRIX						<del></del>			ıtrix							1		Lionvi	iie Lai	bórato	ory Us	e Onl	у	1			
S - Soi SE - Soi SO - Soi	l diment	Lab ID	   	Clien	nt ID/Desci	ription		Che	AC osen √)	Matrix	Date Collected	Time Collected	H + 29	0625 x 05 60	OPED		06es c		Ì	z c 6 M c 7 €		3MORG.	HUT				
SL - Slu W - Wa	dge		- ·					MS	MSD	<del>                                     </del>	2 :: 4	1206							}				<del>                                     </del>				
O - Oil A - Air		$\infty$ L	B16	541	L			1	<b>Y</b> _	5_	3-11-05	1045	-				L.				100	}					
DS - Dr.	ım i	<b>]</b> -	<del> </del>					}	├─	<del> </del>	<del> </del>						<del> </del>				<del> </del> -	<del> </del>	<del> </del>				<del> </del> -
DL - Dru		<b> </b> -	<del> </del> -					}	<del>}</del>	<b>}</b> -	<del> </del>	}						<del>  </del>			<del> </del> -	<del> </del> -	<del>}</del>				<del> </del>
L- EP		<u> </u>	<del> </del>					├	├	<del> </del>	<del> </del> -	<u> </u>	<del> </del>	<del> </del>								<del> </del>	<del> </del>				
WI - Win	De .	<del> </del>	<del> </del>		<del></del>			├	├			<del></del>	<del> </del>				<b></b> -				<del> </del>		┼─				
F- Fis		<b>}</b> -	<del>}</del>					<del> </del> -	├	<del> </del>	<del> </del>		<del>                                     </del>	}			<del> </del>	<del>                                     </del>					$\dagger$				<del>                                     </del>
}		}	<b></b>					├	├	<del> </del>	<del> </del>		<del>                                     </del>				<del> </del>				-	<del> </del>	<del>                                     </del>	<del> </del>			
		<b>}</b> -	<del>}</del>				<u> </u>	├─-	<del> </del> -	<del> </del> -	<del> </del> -	ļ	├-	<del> </del>		 		<del>                                     </del>				<del> </del>	<del>                                     </del>	<del>                                     </del>			
}		}	<del>}</del> -					├─	<del> </del>	<del>                                     </del>	<del> </del>	<u> </u>	<del>                                     </del>	-								1	1				
Special	Instruct	lions:	- 1	<u>بر</u> س	E0 3	3-003	<del></del>	<u> </u>	DATE	REVISION	$A_{5}$ , $A_{5}$ , $\theta$	011	7,0	<u> </u>	A.	Α.	<u>ر.</u> .	<b>I</b> I: 1/.	 		<del></del>	Lionv	lle Lab	oratory	Use O	nly	<del></del>
			2 H	P ***	10.	,,				•	1. <u>F13. U</u>	<u>, , , , , , , , , , , , , , , , , , , </u>	<u>-[,]</u>	<u>ي. سي</u> 104 ما	1 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ANIL	<u> </u>	ad d	<u>EN.11</u> 112 417	Sa	amples Shippe	were:	_ or		mper Resi Present		
1									TNO	46 0	ء الادر				-	<u>rvy</u>	103	74. [	<u> </u>	H	and De	livered		Pa	ickage(	Y )or	N
1											3. (NH3	N IC	μτυ	<u> </u>	SFO	<del></del>	· <u>·</u>			- 5	10 11 11 11 11 11 11 11 11 11 11 11 11 1	Bel	1	2) Pa	Unbrok ackage (	er on ( Y) or	Outer N
											4										Ambie	~			Presen	ion Sa	ample
1											5										Receivender			4)	Unbrok	(Y) or	, 14
											6										Sampl roperty		ved	S	ample/	or	
Relin	quished	d ]	Receive	d	Date	Time	Re	elinqui	ished	1	Received		Date	Tir	ne			es Betw				න	or N		OC Rec pon San	nple Re	ec't
10	by	<del></del>	by		<del>7</del>	<del> </del>		<del></del>	0.4	osm	by	-dr	IGI	AL	$\dashv$	COC	: Recor	nbelsan od?Yo	и М		Received		thin	C	ooler	(L) ol	r N
tu	180		Hen	3	1/3/03	0955		<del></del>	WA	SIE	·- <del>;</del>	REV	VRI	TE	N	NOT	FS.	290	~				or N		emp	<u></u>	_ ℃

FH-Central Platea	u Project	CI	HAIN OF CUST	ODY/S	AMPL	E ANAL	<u>YSIS</u>	R	EQUEST		F03	-003-155	Page 1	of <u>i</u>
Collector Fahlberg/Johansen/Thomas			any Contact Cearlock	Telepho 373-3					roject Coordin RENT, SJ	ator P	rice Code	8N	Data Tur	
Project Designation 200 Area Source Characteriza	tion 200-CS-1 OU - So		ing Location chole B8828 (100-102 ft)	)				_	AF No. 03-003	A	ir Quality		45 1	Days
ice Chest No.	11-025		Logbook No. F-N-3251			m5 3-6-0. <del>1832</del> :			lethod of Shipi Federal Expres					
Shipped To EBERLINE SERVICES (For	MENY TMA) RECL	Offsite	e Property No. 170	30 14	64		·	The state of the s	Bill of Lading/	Air Bill No	790	2_2	902	3746
POSSIBLE SAMPLE HAZA	. *		Preservation	Cool 4C	Cool 4C	Cool 4C	Cool	i 4C	None	None	None	None	None	
T: To IS Special Handling and/or S	15 XM;		Type of Container	aG	aG	aG	aC		aG	aG	aG	aG	3	
C00/1			No. of Container(s)	250mL	250mL	. 250mL	250		1 500mL	1 500mL	1 125mL	1000mL	71 7125mL	
	· <del></del>		Volume	VOA - 8260A			PCBs -	- 808;		See item (3) in		See item (%) in	Nickel-63;	
	SAMPLE ANAL	YSIS		(TCL)	Special Instruction				Special Instructions.	Special Instructions,	9045	Special Instructions	Technetium- 99; Tritium - H3	
Sample No.	Matrix *	Sample Date	Sample Time									7.4.		
B16541	SOIL	3-11-03	10H5	X	X	<del>  X</del>	×	<u> </u>	$+\times$	×	X	/	<u> </u>	
CHAIN OF POSSESSIO		Sign/Prin		. #:		ECIAL INSTI			S letectable, and rep	ort diesel and	d kernsene rang	e compounds fi	om WTPH-	Matrix *
Relinquished By/Removed From Relinquished By/Removed From	Date/Time 1230	Received By/Stor	R.finiber 3	te/Time 1/1/03	1230 D	analysis, FH ackn nalyze pH within	towledge	s tha	at the holding time	for Nitrate t	by EPA 300.0 o	r 9056 will not	be met.	S=Soit SE=Setiment SO=Solid S1=Studge
K. Felle R.F.	1/2 3.11 cm	3 33	3728 3.	11.03	(1)				On) (Tributyl phos trace) (Arsenic, B				m, Silver);	W = Water O=Oil
Retinquished By/Removed From 3 13 3728 10	Date/Time	Received By/Sto	red in Rock in	te/Time /	ic		(Superti	trace	Add-On) (Berylli					A=Air DS=Drum Solids DL=Drum Liquids
Relinquished By/Removed From E				ate/Time	(3)	) IC Anions - 300	0.0 (Chlo	oride	, Fluoride, Nitrate e - 9010; Sulfides		osphate, Sulfate	); NO2/NO3 - :		T=Tissuc Wi=Wine
VZ-Falley X.f.	416- 3-18-03	Feel	<u> </u>	ate/Time	(4)	) Gross Alpha, Q	ross Bet	a, G	amma Spectrosco pec - Add-on (All	py (Cesium-			, Europium-	39600
Retinguished By/Removed From Relinguished By/Removed From	3-13-03 0955 Date/Time	Received By/Sto	Frem 3-13	ate/Time	150 Iso		horium-	-232	); Isotopic Uraniu				ium-	39610
					itle								ate/Time	<b> </b>
LABORATORY Received By SECTION	<b>,</b>													
FINAL SAMPLE Disposal Mo	ethod					Disp	osed By					1	Date/Time	

## LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFOLD

Purchase Order/Project:

DATE: 3-13-03

SAF#/ SOW# / Release #: F03 -043

Laboratory SDG #: 03031932

NOTE:	ALL ENTRIES MARKED "NO" MUST BE	EXPLAINÆD II	THE COMM	ENT SECTION	 
1.	Custody seals on coolers or shipping container intact, signed and dated?	€ Xes	. □ No	O N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	© Yes	□ No	□ N/A	See Comment #
3.	Airbill # recorded?	E Yes	□ No	□ N/A	see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	E Yes	□ No	□ N/A	See Comment #
5.	Sample containers are intact?	D Y of	□ No	□ N/A	see Comment #
6.	Custody seals on sample containers intact, signed and dated?	∏ Yes	□ No:	□ N/A	□ see Comment #
7.	All samples on coc received?	E Yes	□ No	□ N/A	see Comment #
8.	All sample label information matches coc?	Ves	□ No	D N/A	🗓 see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	ပ် Yes	□ No	□ N/A	See Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DXes	□ No	□ Ñ/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	□ N <sub>0</sub>	(B-N/A	see Comment #
12.	coc signed and dated?	E Yes	□ No	D N/A	🖸 see Comment #
. 13.	coc will be faxed or emailed to client?	Yes.	□ No	□ N/A	D see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	A/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

Lied Venil

# Lionville Laboratory, Inc. DRO ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541	001	s	03LE0352	03/11/03	03/25/03	04/02/03
B16541	001 MS	S	03LE0352	03/11/03	03/25/03	04/02/03
B16541	001 MSD	S	03LE0352	03/11/03	03/25/03	04/02/03
LAB QC:						
BLK	MB1	s	03LE0352	N/A	03/25/03	04/02/03
BLK	MB1 BS	S	03LE0352	N/A	03/25/03	04/02/03
						48 m/1/3





## **Analytical Report**

Client: TNU-HANFORD F03-003

LVL#: 0303L932

SDG/SAF # H2098/F03-003

W.O. #: 11343-606-001-9999-00 Date Received: 03-13-2003

#### DIESEL RANGE ORGANICS

One (1) soil sample was collected on 03-11-2003.

The sample and its associated QC samples were extracted on 03-25-2003 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 04-02-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B. The analysis met the intent of method WTPH-D.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
- 2. The required holding time for extraction and analysis has been met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. All surrogate recoveries were within acceptance criteria.
- 5. The blank spike recovery was within acceptance criteria.
- 6. The matrix spike recoveries were within acceptance criteria.
- 7. All initial calibrations associated with this data set were within acceptance criteria.
- 8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

L'aboratory Manager

Lionville Laboratory Incorporated

som\r:\group\data\dro\tmu hanford\0303-932.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

Date



## GLOSSARY OF DIESEL RANGE ORGANICS DATA

## **DATA QUALIFIERS**

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

### **ABBREVIATIONS**

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



## GLOSSARY OF DIESEL RANGE ORGANICS DATA

- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC Report Date: 04/09/03 14:11

	Cust ID:	B1654	L	B16541	L	B16541	L	BLK		BLK BS		
Sample	RFW#:	00:	L	001 MS	3	001 MSI	)	03LE0352-N	Œ1	03LE0352-1	Œ1	<i>l</i>
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	D.F.:	1.0	00	1.0	00	1.0	00	1.0	00	1.0	00	
•	Units:	mg/l	(g	mg/k	(g	mg/F	(g	mg/I	ζg	mg/I	ζg	
	p-Terphenyl	89	8	109	*	95	ક	91	ક	90	왕	
			==fl <b>==</b>	.=======	==fl==	========	==fl	#========	==f1		==fl=	======fl
Diesel Range Organi	ics	12.5		86	४	80	ક્ષ	12.0	U	71	ક	
Kerosene		12.5	Ŭ	12.5	U	12.5	U	12.0	Ų	12.0	U	

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

Lionville Labor	atory (	Jse Only	Custo	ody T	rans	sfe	er I	Rec	ord/l	ab '	Wo	rk	Re	qu	ıes	<b>t</b> Pa	ge_	<u>o</u>	f	-	1	31	\/	1	I
03030	.93	2		FIELD	PERSO	NNE	EL: C	OMPLE	ETE ONL	Y SHAD	ED A	REA	s C		G			E		F	G		ONVILLELA	BORATOR	y INC.
Client	Vu-	HANFOL	LD SA	F# FO	3-00	3		Retrige	erator #		1	6			6			6		6	6			-	Z
Est. Final Pro		-			_ <del></del>			#/Tunn	Container	Liquid															
Project #			- 606-	001-99	99.00			#/Type	Container	Solid	146	IAC	IK		IAL			146		IAG	IAG				
Project Conta	ict/Pho	ne#	<u> </u>					Volume	8	Liquid	<u> </u>			<u> </u>	ļ			-	Ļ	ļ <u> </u>		<u> </u>	<b> </b>		
Lionville Lab	oratory	Project Mar	nager	07			<del></del>	<u> </u>		Solid	250	250	220	<u> </u>	250			250	├	500	60	<b> </b>	<del>{</del> {	<del></del>	
ac SPEC		Del	S TAT.	30	chay 1		====	Preser	vatives		+=	ORG	ANIC	<u> </u>	ALK			INC	DRG	TC	<del></del>	<del></del>	╂──┥		
Date Rec'd	3-1	3-03	_ Date Due	, 4	-(2-0	3		REQUI		-	βŞ		PCB CB	Herb	GI YOU			Melal	S	AN ON	PH				
MATRIX	]						trix							1	·	Lionvi	lle La	borate				1	<del></del>	_ <del></del> _	
CODES: S - Soll SE - Sediment SO - Solid	Lab ID		Client ID/Des	cription		Cho (c	aC osen ⊬)	Matrix	Date Collected	Time Collected	H 7790	0625 x	OPED		06esc			ACTO ACTO		JWORG.	HOT				
SL - Sludge W - Water		10115	5 <i>U</i> 1			MS	MSD	5	3-11-03	INIC	1 -	-	-		1			-	10	<del>                                     </del>		<b></b> -	┞╼┥		
O- Oil A- Air	001	DI 1816541				<i>V</i> _	<del> </del>	-3-	D 71-03	1043	┼╌	1		-					13.2	1					
DS - Drum Solids	<del>                                     </del>	<del> </del>				·	<del>                                     </del>		<del> </del>	ļ	_								<del>                                     </del>	1		-	<del>                                     </del>		
DL - Drum Liquids	<del> </del>	<del> </del>			— <del></del> }		_	<del> </del>	<del>                                     </del>	<del> </del>	<del>                                     </del>		-		_			_		<del>                                     </del>	1	_			
L - EP/TCLP Leachate	<u> </u>	<del> </del>	<del></del>		<del></del>				1	<del> </del>	1	<u> </u>													
WI - Wipe X - Other	<del> </del>	<del> </del>							<del>                                     </del>				1												
F - Fish	<b> </b>	<del>                                     </del>				· ——-	<del>                                     </del>		<b> </b> -	<u> </u>									$\prod$						
		<b>†</b>																							
		<del>                                     </del>	<del></del>	<del></del> -				<del> </del>		<u> </u>															
Í		<del> </del>	<del></del>																						
Special Instruc	tions:	- 0.5	= # F0	2-003			DATE	REVISIO	1. As, B	010	2 0	٦ ا	4	A.	۴.,	H. v.	2. U	ı,Γ		Lionvi	lle Labo	oratory	Use Or	nly	
1		2 H F	> 4x 10	J J																were:			mper Resid		
							TWO		2. (CCL,					<u>, ۲                                   </u>	<u>, [C)</u>	<u> </u>	<u> </u>	- I H	and De	livered		Pa	ckage/	Y or	N
									3. <u>(NH3</u>	N (C	μτυ	L	SFO			<del></del>		-  \$	irbill# .	Bel	1	2) Pa	Unbroke ackage (	an on O	iuter N
4 2) Ambient or Effilled 3) Present on Sa											_	mple													
]									5									-   3) -   C	Necei ondition	ved in (	or N	4)	Unbroke		14
									6										Sampl	les Preser	ved	Sa	ample 🗘	or I	
Reiinquishe	3	Received	Date	Time	Rei	inqui			Received by		)ate	Tir	ne			ies Betw				80	or N	Uţ	OC Reco	iple Red	C't
by D	<del> -,</del>	by /	0 7/1			<del>-</del> ~	0:::9	OSIT	E Dy	- OR	IGIN	AL		coc	Recor	nbels and d?Y o	r (5)		Received	ved Wil Times	thin	Cc	ooler (	(a) ou	N
He VER	_//	· Head	2/13/03	0955		<del>-</del>	_WA	SIE		REV	VR11	TE	N	NOT	'ES: ን <i>ዕ</i> ጋ	290	a :		_	` `	жΝ		emp	-3	°C
}	J		$\omega_1$	1	] ]			j				L		<u></u>			·	$\prime$ $\prime$	<u> </u>						

FH-Central	l Plateau Project		CHAIN OF CUST	ODY/S	AMPL	E ANAL'	YSIS	REQUEST	Γ	F03	-003-155	Page 1	of <u>1</u>
Collector Fahlberg/Johansen/1	Thomas		npany Contact S Cearlock	Telepho 373-3				Project Coordi TRENT, SJ	nator	Price Code	8N		rnaround
Project Designation 200 Area Source Ch	haracterization 200-CS-1 OU - So		apling Location Borehole B8828 (100-102 ft)	)	_			SAF No. F03-003		Air Quality		45	Days \
Ice Chest No.	201-025	Fiel	d Logbook No. INF-N-3251			ms 3-6-03		Method of Ship Federal Expre					
Shinard To	ICES (FORMERLY TMA) RECU	A om	site Property No.	30 14	,4			Bill of Lading	'Air Bill N	10. 790	<u> </u>	202	3746
POSSIBLE SAMPL	E HAZARDS/REMARKS		Preservation	Cool 4C	Cool 4C	Cool 4C	Cool	4C None	None	None	None	None	
T: To	SISXMI and/or Storage		Type of Container	aG	aG	aG	aG		aG	аG	aG	35	
	00/40		No. of Container(s)	250mL	1	1	1	1	-	ლე-ე-დ <u>ე</u>	1	10/21	
}	-		Volume		250mL	250mL	250ถ	nL 500mL	500mL	123mil Leonni	1000mL	7125mL	
	SAMPLE ANAI	.ysis		VOA - 8260A (TCL)	See item (1) i Special Instructions	Glycols, &	PCBs -	8082 See item (2) in Special Instructions.	See item (3) Special Instruction	9045	See item (4) in Special Instructions	Nickei-63; Technetium- 99; Tritium - H3	
Sample No.	Matrix *	Sample Da			a kon i stranovini A sili sili sili sili sili sili sili sil						ŢŹŢŢ		
B16541	SOIL	3-11-03	1045	X	X	X	_ ×	<del>    ×</del>	×	X	/		
<u> </u>		<del></del>											
CHAIN OF POS	SSESSION	Sign/Pr	int Names	<u> </u>	SPE	CIAL INSTR	UCTIO	 DNS	<u></u>				Matrix *
Relinquished By/Removed Relinquished By/Removed 3 3 3 2 8 Relinquished By/Removed Relinquished By/Removed Relinquished By/Removed Relinquished By/Removed Relinquished By/Removed	From	stored in SR Da R. F. H. B. Da 3 72 8 3 .  stored in Da LL R. F. H. L.  stored in Da LL R. F. H. L.  stored in Da  stored in Da  stored in Da  do Da	te/Time	Lab D ar Anal (1) (2) (2) (3) (4) (4) (5) (5) (5) (5) (6) (7) (7) (7) (7) (7) (8) (9) (9) (9) (9) (9) (9) (9) (9) (9) (9	reports Decane a alysis. FH acknotyce pH within 2: Semi-VOA 82 ICP Metals - 6010A 1 - (CV); Chromi IC Anions - 300. monia - 350.3; To Gross Alpha; Or Europium-155);	as a TIC owledges 4 hr of re 70A (Ad 10A (Supertra 10M Hex 0 (Chlorotal Cyan 10SS Beta; Gamma 10OSS Beta; Gamma 10OSS Beta;	if detectable, and rej that the holding tim ceipt.  d-On) {Tributyl pho ertrace) {Arsenic, B ice Add-On) {Beryll- 7196 ide, Fluoride, Nitrati ide - 9010; Sulfides Uamma Spectrosco Spec - Add-on {An 32}; Isotopic Uranti	sphate); TP arium, Cadi ium, Coppe c, Nitrite, Pl - 9030 py {Cesium lericitum-24	H-Diesel Range nium, Chromium r, Nickel, Vanadi nosphate, Sulfate r137, Cobalt 60, r, Radium-228;	r 9056 will not  WTPH-D , Lead, Selenium, Zinc}; Men  ; NO2/NO3 - 3  Europium-152; Isotopic Pluton um-237; Stronti	m, Silver}; rcury - 353.2; Europium-	S-Soil SE-Schinces SO-Solid SI-Shadge W = Water O-Oil A-Air DS-Dram Solids DL-Dram Liquids T-Tissue WI-Wipe D-Diff VV vgetalby VV vgetalby	
SECTION FINAL SAMPLE D	SECTION FINAL SAMPLE Disposal Method				<del></del>	Dispos	sed By				2	ate/Time	
DISPOSITION	er to be some TAPACCAMA					<u>.</u>	•					<u>.</u>	

## LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF#/ SOW# / Release #: F03 -043

Laboratory SDG #: 03036932

NOTE:	ALL ENTRIES MARKED "NO" MUST BE	Explained in	THE COMM	ENT SECTION	
1.	Custody seals on coolers or shipping container intact, signed and dated?	Ū.¥es	. DNo .	□ N/A	See Comment #
2.	Outside of coolers or shipping containers are free from damage?	© Yes	□ No	□ N/A	See Comment #
3.	Airbill # recorded?	E Yes	□ No	D N/A	□ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	P Yes	□ No	D N/A	☐ see Comment #
5.	Sample containers are intact?	to Yes	□ No	□ N/A	□ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	₽/Yes	□ No	□ N/A	☐ see Comment #
7.	All samples on coc received?	₩ Yeş	□ N <sub>0</sub>	□ N/A	see Comment #
8.	All sample label information matches coc?	T) Yes	□ No	□ N/A·	see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	Ú Yes	□N <sub>0</sub>	□ N/A	See Comment #
10	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DX es	□ No	□ N/A	☐ see Comment #
11	. Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DANIA	D see Comment #
12	. coc signed and dated?	B Yes	□ No	□ N/A	see Comment #
13	. coc will be faxed or emailed to client?	<b>⊡</b> Yes∗	□ No	□ N/A	See Comment #
14	. Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	see Comment #

C	ooler	#/	temp	(°C)	and	Comments:

C-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

Lied Vent

### Lionville Laboratory, Inc. PCB ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03

LVL LOT # :0303L932

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						<del></del>
B16541	001	S	03LE0296	03/11/03	03/14/03	03/27/03
B16541	001 MS	s	03LE0296	03/11/03	03/14/03	03/27/03
B16541	001 MSD	S	03LE0296	03/11/03	03/14/03	03/27/03
LAB QC:						
PBLKOM	MB1	s	03LE0296	N/A	03/14/03	03/27/03
PBLKOM	MB1 BS	S	03LE0296	N/A	03/14/03	03/27/03

For As 153





### **Analytical Report**

Client: TNU-HANFORD F03-003

LVL#: 0303L932

**SDG/SAF** # H2098/F03-003

W.O. #: 11343-606-001-9999-00

**Date Received:** 03-13-2003

#### **PCB**

One (1) soil sample was collected on 03-11-2003.

The sample and its associated QC samples were extracted on 03-14-2003 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 03-27-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- All results presented in this report are derived from a sample that met LvLI's sample acceptance 1. policy.
- 2. The required holding time for extraction and analysis has been met.
- 3. The sample and its associated QC samples received a Sulfuric Acid cleanup.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. The blank spike recoveries were within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- 8. All initial calibrations associated with this data set were within acceptance criteria.
- 9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Laboratory Manager

Lionville Laboratory Incorporated

som\r:\group\data\pest\tnu hanford\0303-932.pcb The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.



## GLOSSARY OF PESTICIDE/PCB DATA

## DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

#### **ABBREVIATIONS**

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



### GLOSSARY OF PESTICIDE/PCB DATA

- P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.

#### Lionville Laboratory, Inc.

PCBs by GC

Report Date: 04/04/03 15:20 Client: TNUHANFORD F03-003 H2098 Work Order: 11343606001 Page: 1 RFW Batch Number: 0303L932

	Cust ID:	B16541	L	B16541	-	B16541	-	PBLKOM		PBLKOM BS		
Sample	RFW#:	001	L	001 MS	3	001 MSD	)	03LE0296-M	В1	03LE0296-1	<b>œ</b> 1	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	D.F.:	1.0	00	1.0	0	1.0	0	1.0	0	1.0	0	
	Units:	UG/I	(G	UG/H	KG	UG/K	(G	UG/K	G	UG/I	ζG	
Surrogate:	Tetrachloro-m-xylene	75	*	80	*	80	%	80	*	85	ક	
_	Decachlorobiphenyl	95	ક	110	ક	105	૪	100	%	105	ક્ષ	
		=======	==fl <b>==</b>	=======	-=fl		=f1	========	=f1	.========	== <b>f</b> l	_======f1
Aroclor-1016	5	35	U	80	ક	87	ક	33	Ū	83	8	
Aroclor-1221	<u> </u>	69	U	69	U	69	U	67	U	67	U	
Aroclor-1232	2	35	Ų	35	U	35	U	33	U	33	U	
Aroclor-1242	2	35	U	35	U	35	U	33	Ū	33	U	
Aroclor-1248	3	35	U	35	U	35	U	33	U	33	U	
Aroclor-1254	<u> </u>	35	U	35	U	35	U	33	Ū	33	U	
Aroclor-1260	)	35	U	99	8	97	옿	33	Ū	95	ક	

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

Lionville Labor	atory	Use Only	C	usto	dy T	ran	ste	er F	Rec	ord/L	ab '	Wc	rk	He	qu	es	I Pag	ge_	<u></u> 0t			T	7 1	1	11.	ł
03031	93	32	•							TE ONL			REA:		•	G	·				F	G			ABORATO	K
Client	VU-	HAUFE	56D	SAF	EN FO	23-00	73		Refrige	rator #		1	6	6		6		7	6		6	6	, — ,			
Est. Final Pro				<u></u>		<u> </u>					Liquid							_			<del>                                     </del>					
Project #	ŋ. <i>3</i> 611	:Piniy Date ` 134)	3- 60	06-0	01- 94	99.00	)	#/Type Container		Solid	146	IAC	[K-		IAL			146		1AG-	IAG	ļ				
Project Conta						<del> </del>					Liquid	11345	- <del></del>	1/10					<i>,</i>		1710	1 .				
Lionville Labo				,	0:	2			Volume	•	Solid	257	250	asb		250			<b>59</b> 0		300	60				
OC SPEC					30	ربعط		<del></del>	Preserv	ratives		_	-	_							-	-				
				<u> </u>					-		VCEC		<del>,</del>	ANIC		ALK				RG	τç	PH				
Date Rec'd	3-	13-03	D	ate Due	4	-(2-0	3		REQUE		<b>-</b>	ΑŞ	B A A	PCB	Herb	Keigh Keigh			Mega_		Wigh					<u>.</u>
MATRIX	1							trix			1	<u> </u>	τ		1		Lionvill	le Lat	orate	ory Us	e Ont	<b>y</b>	<del>                                     </del>			
CODES: S - Soil SE - Sediment	Lab ID		Clien	nt ID/Desc	ription	;	Che	osen v/)	Matrix	Date Collected	Time Collected	H + 790	0625 X	90		06esc			AET (C		JANGG.	1)07				
SO - Solid SL - Sludge	<u> </u>	<u></u>				<u>.</u>	MS	MSD			ļ	ŏ	0	0		9			N €		3		<u></u>	<b> </b>		
W - Water Q - Oil	$ \infty $	B16.	<u>54</u> ]				1/	$\angle$	5_	3-11-05	1045	L						}		150	1	1	<u> </u>	<b>.</b>		<del></del>
A - Air DS - Drum	<u> </u>	1					T I					<u> </u>	<u> </u>					]			<b>_</b>		<u> </u>	<u> </u>		<u> </u>
Solids DL - Drum				•							<u> </u>	<u> </u>	<u> </u>					]			<u> </u>					
Liquids							$\lceil \rceil$	]				<u>L</u> _											<u> </u>			
L - EP/TCLP Leachate	<b> </b>																				<u> </u>					
WI - Wipe X - Other		<del>                                     </del>				-,																	<u> </u>			
F- Fish	}	<u> </u>	<del></del>			"														<u> </u>			L			
	├		<del> </del>	<u></u>	<del></del>															L						
	<b> </b>			<del></del>			<del> </del>	<del>                                     </del>	 '		l	1										<u> </u>	<u> </u>			
	<del> </del>	<del></del>					<del>                                     </del>	<del>                                     </del>										[								
	<u> </u>						i	DATE/	REVISIO	NS: /) Q	010	2 0	, <	Λ	٥	Λ	H' v :	2 11			Lionvi	lie Labo	oratory	Use O	nty	
Special Instruct	JQ118.	5 A	F#	FO:	3-003			IN	170	1. As, B	a.ld.	-C. I.	b. Je	19	. De,	UI.	N1, V, Z	<i>0.1</i> 1	Sa		were:/				istant Sea tog Ou	
							,	INOK	<u>60</u>	<sub>2.</sub> ا <del>دد</del> ر,	icfl, (C	:NO3.	ICNO:	<u>l</u> lc	<u> 104</u>	(CS	04 <u>,</u> (N	345	·/ Ha	Shippe and Del	ivered	_ or 	r) Pa	ckage/	(∕Y))or	N
										3 [NH3	N IC	NTO	, LS	FD					&ir	bili# _	1	//	2)	Unbrok	on C	outer N
															_				2)	Ambie	nt or 2	filled			Ƴ)or ton Sa	
																			3)	Receiv	ed in G	bood		4	(A) or	N
										5									,	ondition Sample	( <i>f</i> )∘ es	r N		Unbrok mple /	en on	N
							<del></del>	6	<del></del>							==	_J → <sub>Pro</sub>	operly I	Preserv		CC	OC Rec	ord Pres	sent		
Refinquished Received Date Time Relinquished by						,	Received by	4	ate	Tim	e	Samp	oles La	es Betwe bels and		5)	Receiv	ed With		Up	on San	noke Red (Y∕)or				
600	<del>-   ,</del>	127	7	1/3/03	ran				OSITI		UK	GI	IAL		NOTE	FS.	d?Y or	~	Ho	lding T	imes	Cooler . 3				
Full se		YVI	3	<u> 201/11</u>	0955			_WA	STE	<u>.                                  </u>	REV	VRI	TE	N	79	ر جن	290	33	74	6	9。	r N	16			

Relinquished by	by	Date	Time
COMPO		MEDIN	AL
RA3		EWRI	TEN

FH-Centr	al Plateau Pi	roject	C	HAIN OF CUST	ODY/S	SAMP	LE	ANAL'	YSIS	REQUES'	Г	F03	-003-155	Page 1	of <u>1</u>
Collector Fahlberg/Johanse	n/Thomas		Comp	oany Contact Cearlock	Telepho 373-3	ne No.				Project Coord TRENT, SJ		Price Code	8N	Data Tu	rnaround
Project Designation	n	00-CS-1 OU - Soil S	Sampl Samp	oling Location rehole B8828 (100-102 ft)	)	<del></del>				SAF No. F03-003		Air Quality		45	Days \
Ice Chest No.	PC OL	-025		Logbook No. IF-N-3251				15 3-6-03 0-118322		Method of Shi Federal Expr		"			
China dara		TMAJ RECLY	Offsi	te Property No.	30 14	64				Bill of Lading	/Air Bill !	*°. 790	ح_ّ ح	2902	3746
POSSIBLE SAMI	PLE HAZARDS/I	REMARKS		Preservation	Cool 4C	Cool 4	4C	Cool 4C	Cool	4C None	None	None	None	None	
T: _ T	6 1315	XMI		Type of Container	аG	aG		аG	aG	aG	aG	aG	aG	195	
l .	200/4°C			No. of Container(s)		l		1	1	1	1	ლე∙ე45 ე	1	18/1	
				Volume	250mL	250m	ու	250mL	250п	nL 500mL	500mL	125me Leone	1000mL	) 125mL	
		SAMPLE ANALYS	sis		VOA - \$260A (TCL)	See item ( Special Instruction	i 1	Alcohols, Glycols, & Glycols, & 8015M (Add- on) (1- Propanol, Ethanol)	PCBs -	8082 See item (2) in Special Instructions.	See item (3 Special Instruction	9045	See item (Frin Special Insururação	Nickel-63; Technetium- 99; Tritium - H3	
Sample N	0.	Matrix *	Sample Date	Sample Time		ر بر در			ه در چې د فر د منتسب						
B16541		SOIL	3-11-03	03 1045		X	_	X_	×	×	X	$+\times$	<u> </u>		 
<del></del>					ļ	╂	$\dashv$								
			<del></del>			<del>                                     </del>	-			_					
Retinquished By/Remover Application of the By/Remover B	ved From  Ped From  Ved From  J-13	Referrible 3 red in Da 3728 3 red in Da Con Per A Harris Da Tred In Da Tred In Da Area In Joan Tred In Joan T	te/fime   Le/fime   Le/fime   Company   Le/fime   Le/fime   Company   Le/fime   Compan	1230 A A (1000 C) (1000 C) (10	ab rep ) analyza 1) Ser 2) ICI CP Me (471 - ( 3) IC Ammor 4) Gre 34, Eussotopic	rsis. FH acknown physics.	as a TIC oveledges 4 hr of re 70A (Add 10A (Supertraum Hex 0 (Chlorotal Cyamoss Bela) Gamana norium-2	if detectable, and re that the holding time ceipt.  d-On) {Tributyl photertrace} {Arsenic, Fice Add-On) {Beryl-7196} ide, Fluoride, Nitratide - 9010; Sulfides Usamma Spectrosci Spec - Add-On {Arsa2}; Isotopic Uranna	e for Nitrate sphate}; TF sarium, Cad lium, Coppe e, Nitrite, Pi - 9030 py {Cesium tericium-24	PH-Diesel Range- mium, Chromium, Chromium, Chromium, I, Nickel, Vanadi hosphate, Sulfate)	r 9056 will not lead, Selenium, Lead, Selenium, Linc}; Mer ry, NO2/NO3 - 3  Europium-152; Isotopie Plutonium-237; Stronti	n, Silver}; cury - 53.2; Europium-	Matrix *  S-Soil SE-Sodiment SO-Solid SI-Shedge W - Water O-Oil A-Air DS-Orum Solids DL-Drum Liquids T-Tissue W-Wipe DYONG		
SECTION FINAL SAMPLE								Dispos	ed By				D	atc/Time	
DISPOSITION															

## LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFOLD

Purchase Order/Project:

DATE: 3-13-03

SAF#/ SOW# / Release #: F03 -003

Laboratory SDG #: 03031932

NOTE:	ALL ENTRIES MARKED "NO" MUST BE I	/	THE COMM	ENT SECTION	1
1.	Custody seals on coolers or shipping container intact, signed and dated?	Q Yes	. DNo .	O N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	Ø∕Yes	□ No	□ N/A	☐ see Comment #
3.	Airbill # recorded?	Yes /	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	Ø Yes	<b>□</b> №	D N/A	☐ see Comment #
5.	Sample containers are intact?	tory	□ No	D N/A	☐ see Comment #
<b>6.</b>	Custody seals on sample containers intact, signed and dated?	∏ Yes	□ No	□ N/A	see Comment #
7.	All samples on coc received?	₽ Yes	□ No	□ N/A	- □ see Comment #
8.	All sample label information matches coc?	D'Yes	□ No	□ N/A·	see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	Ú Yes	□ N <sub>0</sub>	□ N/A	☐ see Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DX:ss	□ N <sub>0</sub>	□ N/A	☐ sec Comment #
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DAVIA	see Comment #
12.	. coc signed and dated?	E Yes	□ No	D N/A	See Comment #
13	. coc will be faxed or emailed to client?	Yes.	□ N <sub>0</sub>	□ N/A	1 see Comment #
14	Project Manager/Client contacted concerning discrepancies? (name/date)	^ □ Yes	□ No	□ N/A	see Comment #

Cooler # / temp (°C) and Comments:

1001-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

Tiet Venil



# Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541						
SILVER, TOTAL	001	s	03L0151	03/11/03	03/20/03	03/25/03
SILVER, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
SILVER, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
ARSENIC, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
ARSENIC, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
ARSENIC, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
BARIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
BARIUM, TOTAL	001 REP	s	03L0151	03/11/03	03/20/03	03/25/03
BARIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
BERYLLIUM, TOTAL	001	s	03L0151	03/11/03	03/20/03	03/25/03
BERYLLIUM, TOTAL	001 REP	s	03L0151	03/11/03	03/20/03	03/25/03
BERYLLIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
CADMIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
CADMIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
CADMIUM, TOTAL	001 MS	s	03L0151	03/11/03	03/20/03	03/25/03
CHROMIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
CHROMIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
CHROMIUM, TOTAL	001 MS	s	03L0151	03/11/03	03/20/03	03/25/03
COPPER, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
COPPER, TOTAL	001 REP	s	03L0151	03/11/03	03/20/03	03/25/03
COPPER, TOTAL	001 MS	s	03L0151	03/11/03	03/20/03	03/25/03
MERCURY, TOTAL	001	s	03C0058	03/11/03	03/24/03	03/24/03
MERCURY, TOTAL	001 REP	s	03C0058	03/11/03	03/24/03	03/24/03
MERCURY, TOTAL	001 MS	S	03C0058	03/11/03	03/24/03	03/24/03
NICKEL, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
NICKEL, TOTAL	001 REP	s	03L0151	03/11/03	03/20/03	03/25/03
NICKEL, TOTAL	001 MS	s	03L0151	03/11/03	03/20/03	03/25/03
LEAD, TOTAL	001	s	03L0151	03/11/03	03/20/03	03/25/03
LEAD, TOTAL	001 REP	s	03L0151	03/11/03	03/20/03	03/25/03
LEAD, TOTAL	001 MS	s	03L0151	03/11/03	03/20/03	03/25/03
SELENIUM, TOTAL	001	s	03L0151	03/11/03	03/20/03	03/25/03
SELENIUM, TOTAL	001 REP	S	03L0151	03/11/03	03/20/03	03/25/03
SELENIUM, TOTAL	001 MS	S	03L0151	03/11/03	03/20/03	03/25/03
VANADIUM, TOTAL	001	S	03L0151	03/11/03	03/20/03	03/25/03
VANADIUM, TOTAL	001 REP	s	03L0151	03/11/03	03/20/03	03/25/03

### Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13	/03				]	LVL LOT # :0	303L932
CLIENT ID /ANALYSIS	<b>LV</b> L	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	001	MS	s	03L0151 03L0151	03/11/03 03/11/03	03/20/03 03/20/03	03/25/03 03/25/03
ZINC, TOTAL ZINC, TOTAL	001	DED	S	03L0151	03/11/03	03/20/03	03/25/03
ZINC, TOTAL ZINC, TOTAL	001		S	03L0151	03/11/03	03/20/03	03/25/03
LAB QC:							
SILVER LABORATORY	LC1	BS	s	03L0151	N/A	03/20/03	03/22/03
SILVER, TOTAL	MB1		S	03L0151	N/A	03/20/03	03/22/03
ARSENIC LABORATORY	LC1	BS	S	03L0151	N/A	03/20/03	03/22/03
ARSENIC, TOTAL	MB1		S	03L0151	N/A	03/20/03	03/22/03
BARIUM LABORATORY	LC1	BS	S	03L0151	N/A	03/20/03	03/22/03
BARIUM, TOTAL	MB1		S	03L0151	N/A	03/20/03	03/22/03
BERYLLIUM LABORATORY	LC1	BS	S	03L0151	N/A	03/20/03	03/22/03
BERYLLIUM, TOTAL	MB1		S	03L0151	N/A	03/20/03	03/22/03
CADMIUM LABORATORY	LC1	BS	S	03L0151	N/A	03/20/03	03/22/03
CADMIUM, TOTAL	MB1		S	03L0151	N/A	03/20/03	03/22/03
CHROMIUM LABORATORY	LC1	BS	S	03L0151	N/A	03/20/03	03/22/03
CHROMIUM, TOTAL	MB1		S	03L0151	N/A	03/20/03	03/22/03
COPPER LABORATORY	LC1	BS	Ş	03L0151	N/A	03/20/03	03/22/03
COPPER, TOTAL	MB1		S	03L0151	N/A	03/20/03	03/22/03

03L0151

03L0151

03L0151

03L0151

03L0151

S

S

S

S

MB1

MB1

MB1

LC1 BS

LC1 BS

SELENIUM, TOTAL

VANADIUM, TOTAL

ZINC LABORATORY

ZINC, TOTAL

VANADIUM LABORATORY

03/20/03

03/20/03

03/20/03

03/20/03

03/20/03

N/A

N/A

N/A

N/A

03/22/03

03/22/03

03/22/03

03/22/03



## **Analytical Report**

Client: TNU-HANFORD F03-003

LVL#: 0303L932

**SDG/SAF#:** H2098/F03-003

W.O.#: 11343-606-001-9999-00

Date Received: 03-13-03

#### METALS CASE NARRATIVE

- 1. This narrative covers the analyses of 1 soil sample.
- 2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
- 3. All analyses were performed within the required holding times.
- 4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
- 12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of  $\sqrt{\frac{4}{3}}$  pages.

a region of less-certain quantification.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

jjw/m03-932

03-31-03

Date



## METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 03031932

Leaching Procedure:131013111312Other:
CLP Metals Digestion and Analysis Methods:ILM03.0ILM04.0
Metals Digestion Methods:3005A3010A30153020A <u>~</u> 3050B3051200.7SS17

## Metals Analysis Methods

		EPA			
	SW846	EPA	STD MTD	OSWR	USATHAMA
Aluminum	6010B	200.7			99
Antimony	6010B 7041 <sup>5</sup>	<b>—</b> 200.7 204.2			99
Arsenic	~6010B _7060A <sup>5</sup>	$\frac{-}{200.7}$ $\frac{-}{206.2}$	3113B		99
Barium	<del>∽6010B</del>	200.7			99
Beryllium	<b>1 ← 6010B</b>	200.7			99
Bismuth	6010B <sup>1</sup>	200.7 ¹		1620	_99
Boron	6010B	<b>200.7</b>			99
Cadmium	<del>✓</del> 6010B7131A <sup>5</sup>				99
Calcium	-6010B	200.7			_99
Chromium	√6010B7191 <sup>5</sup>	200.7218.2			_SS17
Cobalt		200.7			99
Copper	<del>~</del> 6010B7211 <sup>5</sup>	200.7220.2			99
Iron	6010B	200.7			99
Lead	<u>×</u> 6010B7421 <sup>5</sup>	200.7239.2	_3113B		99
Lithium	6010B7430 <sup>4</sup>	200.7		1620	_99
Magnesium	6010B	200.7			99
Manganese	6010B	200.7			99
Mercury	7470A 3 <u>~</u> 7471A				_99
Molybdenum	6010B	200.7			99
Nickel	<b>№</b> 6010B	200.7			99
Potassium	6010B7610 '	200.7258.1 4			_ <del>99</del>
Rare Earths	6010B <sup>1</sup>	200.7 1		1620	99
Selenium	<b>₹</b> 6010B7740 <sup>5</sup>	200.7270.2	_3113B		99
Silicon	6010B <sup>1</sup>	200.7		<b></b> 1620	99
Silica	6010B	200.7		1620	99
Silver	<b>€</b> 6010B7761 <sup>5</sup>	200.7272.2			99
Sodium	6010B7770 <sup>4</sup>	200.7273.1 4			99
Strontium		200.7			99
Thallium	6010B7841 <sup>5</sup>	200.7279.2	200.9	•	99
Tin	6010B	200.7			99
Titanium	-6010B	<b>200.7</b>			<del>99</del>
Uranium	6010B <sup>1</sup>	200.7 1		1620	99
Vanadium	<del></del> <del>✓</del> 6010B	200.7			<b>99</b>
Zinc	<del>√</del> 6010B	<b>—</b> 200.7			99
Zirconium	6010B <sup>1</sup>			1620	99
		_			5

Method:

Other:\_\_\_\_

L-WI-033/M-03/01

## METHOD REFERENCES AND DATA QUALIFIERS

## **DATA QUALIFIERS**

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

### **ABBREVIATIONS**

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

### ANALYTICAL METAL METHODS

- 1. Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
- 3. Flame AA.
- 4. Graphite Furnace AA.

L-WI-033/N-04/98

#### Lionville Laboratory, Inc.

#### INORGANICS DATA SUMMARY REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0303L932

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
*****		<b>全全等等的企业的企业的企业的企业的企业的企业</b>			RE32555FR	=======
-001	B16541	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	6.4	MG/KG	0.31	1.0
		Barium, Total	77.8	MG/KG	0.009	1.0
		Beryllium, Total	0.35	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	16.5	MG/KG	0.05	1.0
		Copper, Total	12.0	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	14.4	MG/KG	0.16	1.0
		Lead, Total	6.4	MG/KG	0.23	1.0
		Selenium, Total	0.32 u	MG/KG	0.32	1.0
		Vanadium, Total	34.4	MG/KG	0.009	1.0
		Zinc, Total	42.3	MG/KG	0.12	1.0

#### Lionville Laboratory, Inc.

### INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/28/03

CLIENT: TNUHANPORD F03-003 H2098

LVL LOT #: 0303L932

WORK ORI	DER: 1134	3-606-001	-9999-00
----------	-----------	-----------	----------

HOILE, OLDE						
					RBPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
= 0 = P = E E	医医生活性医院医验检 医医性结肠 医生生性	<b>克里尼中亚西哥非拉里里用二里西里哥产业里哥哥</b>	*****			*======
BLANK1	03L0151-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.05	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.09	MG/KG	0.06	1.0
		Copper, Total	0.15	MG/KG	0.06	1.0
		Nickel, Total	0.18 u	MG/KG	0.18	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Vanadium, Total	0.02	MG/KG	0.01	1.0
		Zinc, Total	1.1	MG/KG	0.14	1.0
BLANK1	03C0058-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

#### INORGANICS ACCURACY REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	TRUOMA	*RBCOV	FACTOR (SPK)
****	************		*****	*****	======	E=====	*****
-001	B16541	Silver, Total	4.4	0.07u	4.6	95.7	1.0
		Arsenic, Total	181	6.4	185	94.4	1.0
		Barium, Total	260	77.8	185	98.5	1.0
		Beryllium, Total	4.8	0.35	4.6	95.0	1.0
		Cadmium, Total	4.3	0.04u	4.6	93.3	1.0
		Chromium, Total	34.2	16.5	18.5	95.2	1.0
		Copper, Total	35.3	12.0	23.2	100.6	1.0
		Mercury, Total	0.19	0.02u	0.17	108.7	1.0
		Nickel, Total	57.9	14.4	46.4	93.9	1.0
		Lead, Total	50.0	6.4	46.4	94.2	1.0
		Selenium, Total	175	0.32u	185	94.2	1.0
		Vanadium, Total	81.0	34.4	46.4	100.6	1.0
		Zinc, Total	84.6	42.3	46.4	91.3	1.0

## INORGANICS PRECISION REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098

LVL LOT #: 0303L932

SAMPLE         SITE ID         ANALYTE         RESULT         REPLICATE RPD           -001REP         B16541         Silver, Total         0.07u         0.08u         NC           Arsenic, Total         6.4         6.9         7.5           Barium, Total         77.8         82.3         5.6           Beryllium, Total         0.35         0.40         13.5	FACTOR (REP)  1.0  1.0
-001REP B16541 Silver, Total 0.07u 0.08u NC Arsenic, Total 6.4 6.9 7.5 Barium, Total 77.8 82.3 5.6	1.0
Arsenic, Total 6.4 6.9 7.5 Barium, Total 77.8 82.3 5.6	
Barium, Total 77.8 82.3 5.6	1.0
<b></b>	
Beryllium, Total 0.35 0.40 13.5	1.0
	1.0
Cadmium, Total 0.04u 0.04u NC	1.0
Chromium, Total 16.5 17.6 6.5	1.0
Copper, Total 12.0 12.1 0.83	1.0
Mercury, Total 0.02u 0.01u NC	1.0
Nickel, Total 14.4 15.7 8.6	1.0
Lead, Total 6.4 7.2 11.8	1.0
Selenium, Total 0.32u 0.35u NC	1.0
Vanadium, Total 34.4 37.5 8.6	1.0
Zinc, Total 42.3 45.2 6.6	1.0

#### INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/28/03

CLIENT: TNUHANFORD F03-003 H2098 LVL LOT #: 0303L932

			SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	AMOUNT	UNITS	*RECOV
<b>132587</b>	*******	<b>亚亚亚加拿西亚亚亚西</b> 亚			£22£23	**====
LCS1	03L0151-LC1	Silver, LCS	50.5	50.0	MG/KG	101.0
		Arsenic, LCS	989	1000	MG/KG	98.9
		Barium, LCS	486	500	MG/KG	97.3
		Beryllium, LCS	24.6	25.0	MG/KG	98.4
		Cadmium, LCS	25.6	25.0	MG/KG	102.4
		Chromium, LCS	51.8	50.0	MG/KG	103.6
		Copper, LCS	125	125	MG/KG	100
		Nickel, LCS	202	200	MG/KG	101.0
		Lead, LCS	252	250	MG/KG	101.0
		Selenium, LCS	968	1000	MG/KG	96.8
		Vanadium, LCS	258	250	MG/KG	103.0
		Zinc, LCS	102	100	MG/KG	101.5
LCS1	03C0058-LC1	Mercury, LCS	7.1	6.2	MG/KG	113.6

Lionville Laboratory Use Only Custody Transfer Record/Lab Work Request Page 1 of 1 03031937 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS TNU- HANFORD SAF# F03-003 Refrigerator # 6 Liquid Est. Final Proj. Sampling Date \_\_\_\_ #/Type Container 1AG- 1AG 146 ING 146 Liquid Project Contact/Phone # Volume 250 250 250 500 60 250 Lionville Laboratory Project Manager \_\_\_ 30 clay, oc spec **Preservatives** ORGANIC INORG **ANALYSES** PCB PCB 4-12-03 중 3-13-03 REQUESTED Date Rec'd Lionville Laboratory Use Only Matrix MATRIX OC CODES: 0625 x 9 I  $Q_{o}$ Lab Date Time Chosen Client ID/Description Matrix S - Soil 0665 Collected Collected (v) SE - Sediment SO - Solid MS MSD SL - Sludge W - Water 101 B16541 3-11-03/1045 O- OH A - Air DS - Drum Solids DL - Drum Liquids EP/TCLP Leachate WI - Wipe X - Other F - Fish METO 1. As, Ba, Cd, Cr, Pb, Se, Ag, Be, Cu, Ni, V, Zn. Hg Lionville Laboratory Use Only SAF # F03-003 Special Instructions: Samples were:/ Tamper Resistant Seal was: 1) Present og Outer INORG @ 2 ICCL, ICFL, ICANOS, ICANOZ, ICPOY, ICSOY, INSAIZ, 1) Shipped \_\_\_ or Package / Y or N Hand Delivered \_\_\_\_ 2) Unbroken on Outer 3 (NH3N, ICNTO, ISFD Package (Y) or N 2) Ambient or Chilled 3) Present on Sample (Y) or N 3) Received in Good Condition (1) or N 4) Unbroken on Sample or N 4) Samples Property Preserved COC Record Present (V) or N Relinquished Received Discrepancies Between Upon Samole Rec't Received Time Relinguished Date Date Time Composite Samples Labels and (Y) or N 5) Received Within

WASTE

COC Record? Y or N

7902290237W

Holding Times

(r) or N

FH-Central	Plateau Project	C	HAIN OF CUST	ODY/S	SAMP	LE	ANALY	SIS	R	EQUEST		F03-	-003-155	Page 1	of I
Collector Fahlberg/Johansen/T	homas	Comp	nny Contact Cearlock	Telepho	ne No.				Pr	roject Coordin RENT, SJ	ator F	rice Code	8N	Data Tur	naround
Project Designation 200 Area Source Cha	aracterization 200-CS-1 OU - Soil		ing Location ehole B8828 (100-102 ft)	)						AF No. 03-003	A	ir Quality		45 I	Days
Ice Chest No.	C01-025		Logbook No. F-N-3251				53-6-03 Fil8322			lethod of Ships Federal Expres					
Shipped To ERERLINE SERVICE	CES (Formerly TMA) BECL	P) Offsite	e Property No.	30 1/	64				В	Bill of Lading/	Air Bill No	790	<u>ح</u> _ 2	202_	3746
Radioc			Preservation	Cool 4C	Cool	4C	Cool 4C	Cool	4C	None	None	None	None	None	
T: To	TS15 XM1 and/or Storage		Type of Container	aG	aG	,	aG	aG	3	aG	aG	aG	aG	29	
1	00/40		No. of Container(s)	1	1		1	1		. 1	1	ე ს ს	1	18/1	
			Volume	250mL	250π	mL	250mL	2501	mL	500mL	500mL	123mt Leonal	1000mL	7125mL	
	SAMPLE ANAL	YSIS		VOA - 8260 (TCL)	A See item Speci Instruct	ini	Alcohols, Glycols, & Ketones - 8015M (Add- on) {1- Propenol, Ethanol)	PCBs -	- 808	See item (2) in Special Instructions	See item (3) Special Instructions	9045	Sec item (Fin Special Instruction)	Nickel-63; Technetium- 99; Tritium - H3	
Sample No.	Matrix *	Sample Date	Sample Time								(	100	1		
B16541	SOIL	3-11-03	1045	X	X		X_	_×	<u>_</u>	×	×	<u>×</u>	<del>/</del>	<del> </del> -	
					<b></b>		·			<del></del> -				<del> </del> -	<b> </b>
				$\vdash$						<del>                                     </del>		<del> </del> -		<b></b>	<b></b>
		<del></del>													
Relinquished By/Removed Relinquished By/Removed Relinquished By/Removed Relinquished By/Removed Relinquished By/Removed	From Fr Date/Time    From Date/Time   2 2     From Date/Time   3 - 12 - 0 3     From Date/Time   3 - 13 - 03   075     From Date/Time   3 - 13 - 03   075   075     From Date/Time   3 - 13 - 03   075   075   075     From Date/Time   3 - 13 - 03   075   07	Received By/Sto  Received By/Sto  Received By/Sto  Received By/Sto	REAL DO DE LA PORTE DE LA PORT	ate/Time 3/11/03 ate/Time 14 11/03 ate/Time ate/Time ate/Time	1230	Lab rep D analy Analyz (1) Se (2) IC ICP M 7471 - (3) IC Ammo (A) Ge T54, E Isotopi	ysis, FH acknown pH within 2 mi-VOA ~ 82 P Metals - 60 letals - 60 lotals - 60	as a TIC owledge 4 hr of r 270A (Au 10A (Supertrium Hex .0 (Chlootal Cya oss Bett ; Gamm horium	dd-Cif des the received and considerate and co	detectable, and repart the holding time ipt.  On) {Tributyl pho trace) [Arsenic, Be e Add-On) {Beryll 196 e, Fluoride, Nitrate e - 9010, Sulfate e - 9010, Sulfate pee - Add-on [An ]; Isotopic Urania	e for Nitrate sphate}; TP arium, Cadr lium, Coppe e, Nitrite, PI - 9030 ppy (Cesium Refictum-24	H-Dieset Range mium, Chromium r, Nickel, Vanad hosphate, Sulfate 137, Cobak 60	or 9056 will no  - WTPff-D  1, Lead, Selenit lium, Zinc}; M  2); NO2/NO3 -  1, Europium-15; 1500pic Pluto ium-237; Stron	um, Silver}; ercury - 353.2; 2. Europium- nium;	Matrix * S-Soil SE-Sediment SO-Solid SI-Sludge W - Water O-Oil A-Air DS-Onum Solids DL-Drum Liquids T-Tissue WI-Wipe DOING VVI SEDIMENT SOLID
LABORATORY   R SECTION	Received By				Title		. <u>.</u>								
FINAL SAMPLE DISPOSITION	Disposal Method			<del> </del>			Dispo	sed By						Date/Time	

## LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF# SOW# / Release #: F03 -043

Laboratory SDG #: 03031932

NOTE:	ALL ENTRIES MARKED "NO" MUST BE	EXPLAINED IN	THE COMM	ENT SECTION	
1.	Custody seals on coolers or shipping container intact, signed and dated?	D.Xes	□ No	D N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	DP Yes	□ No	□ N/A	See Comment #
3.	Airbill # recorded?	₽ Yes /	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	₽ Yes	□ No	. □ N/A	☐ see Comment #
5.	Sample containers are intact?	DV Yes	□ No	□ N/A	See Comment #
<b>.</b> 6.	Custody seals on sample containers intact, signed and dated?	Yes	□ No	□ N/A	☐ see Comment #
7.	All samples on coc received?	₽ Yes	□ No	□ N/A	□ see Comment #
8.	All sample label information matches coc?	Vies	□ No	□ N/A·	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	Ú Yes	□ No	□ N/A	see Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	⊕ Xes	□ No	□ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DANIA	see Comment #
12.	coc signed and dated?	E Yes	□ No	□ N/A	see Comment #
13.	coc will be faxed or emailed to client?	Yes.	□ No	□ N/A	see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

RC01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

14



# Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

DATE RECEIVED: 03/13/03 LVL LOT # :0303L932

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16541						
% SOLIDS	001	s	03L%S034	03/11/03	03/17/03	03/18/03
% SOLIDS	001 REP	S	03L%S034	03/11/03	03/17/03	03/18/03
CHLORIDE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
CHLORIDE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
CHLORIDE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
FLUORIDE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
FLUORIDE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
FLUORIDE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRITE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRITE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRITE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
TOTAL CYANIDE	001	S	03LCA27	03/11/03	03/19/03	03/19/03
TOTAL CYANIDE	001 REP	S	03LCA27	03/11/03	03/19/03	03/19/03
TOTAL CYANIDE	001 MS	S	03LCA27	03/11/03	03/19/03	03/19/03
PHOSPHATE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
PHOSPHATE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
PHOSPHATE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
CHROMIUM VI	001	S	03LVI014	03/11/03	03/17/03	03/17/03
CHROMIUM VI	001 REP	S	03LVI014	03/11/03	03/17/03	03/17/03
CHROMIUM VI	001 MS	S	03LVI014	03/11/03	03/17/03	03/17/03
CHROMIUM VI	001 MSD	S	03LVI014	03/11/03	03/17/03	03/17/03
SULFATE BY IC	001	S	03LICC17	03/11/03	03/19/03	03/19/03
SULFATE BY IC	001 REP	S	03LICC17	03/11/03	03/19/03	03/19/03
SULFATE BY IC	001 MS	S	03LICC17	03/11/03	03/19/03	03/19/03
NITRATE NITRITE	001	S	03LN3C17	03/11/03	03/18/03	03/18/03
NITRATE NITRITE	001 REP	S	03LN3C17	03/11/03	03/18/03	03/18/03
NITRATE NITRITE	001 MS	S	03LN3C17	03/11/03	03/18/03	03/18/03
AMMONIA	001	S	03LAMA10	03/11/03	04/03/03	04/03/03
AINOMMA	001 REP	S	03LAMA10	03/11/03	04/03/03	04/03/03
AMMONIA	001 MS	S	03LAMA10	03/11/03	04/03/03	04/03/03
PH	001	S	03LPH020	03/11/03	03/14/03	03/14/03
PH	001 REP	S	03LPH020	03/11/03	03/14/03	03/14/03

## Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD F03-003 H2098

LVL LOT # :0303L932 DATE RECEIVED: 03/13/03 ANALYSIS MTX PREP # COLLECTION EXTR/PREP LVL # CLIENT ID /ANALYSIS 03/20/03 03LSD010 03/18/03 03/11/03 S 001 SULFIDE 03/18/03 03/20/03 03LSD010 0.3/11/03 001 REP S SULFIDE S 03/11/03 03/18/03 03/20/03 03LSD010 001 MS SULFIDE LAB QC: N/A 03/19/03 03/19/03 S 03LICC17 MB1 CHLORIDE BY IC S 03LICC17 N/A 03/19/03 03/19/03 MB1 BS CHLORIDE BY IC S 03LICC17 N/A 03/19/03 03/19/03 MB1 FLUORIDE BY IC 03/19/03 03/19/03 MB1 BS S 03LICC17 N/A FLUORIDE BY IC 03/19/03 03/19/03 S 03LICC17 N/A MB1 NITRITE BY IC 03/19/03 03/19/03 N/A MB1 BS S 03LICC17 NITRITE BY IC 03/19/03 N/A 03/19/03 S 03LICC17 MB1 NITRATE BY IC N/A 03/19/03 03/19/03 NITRATE BY IC MB1 BS S 03LICC17 N/A 03/19/03 03/19/03 TOTAL CYANIDE LCS L S 03LCA27 03/19/03 03/19/03 N/A TOTAL CYANIDE LCS L S 03LCA27 03/19/03 03/19/03 N/A S 03LCA27 TOTAL CYANIDE MB1 03/19/03 03/19/03 N/A PHOSPHATE BY IC MB1 S 03LICC17 03/19/03 03/19/03 N/A PHOSPHATE BY IC S 03LICC17 MB1 BS 03/17/03 03/17/03 03LVI014 N/A S CHROMIUM VI MB1 03/17/03 03LVI014 N/A 03/17/03 S MB1 BS CHROMIUM VI N/A 03/17/03 03/17/03 MB1 BSD S 03LVI014 CHROMIUM VI S 03LICC17 N/A 03/19/03 03/19/03 SULFATE BY IC MB1 N/A 03/19/03 03/19/03 S 03LICC17 MB1 BS SULFATE BY IC 03/18/03 03/18/03 N/A S 03LN3C17 NITRATE NITRITE MB1 03/18/03 03/18/03 N/A S 03LN3C17 NITRATE NITRITE MB1 BS N/A 04/03/03 04/03/03 S 03LAMA10 AMMONIA MB1 N/A 04/03/03 04/03/03 S 03LAMA10 MB1 BS AMMONIA S 03LAMA10 N/A 04/03/03 04/03/03 MB1 BSD AIMOMIA

S

MB1

MB1 BS

SULFIDE

SULFIDE

03LSD010

S 03LSD010

N/A

N/A

03/18/03

03/18/03

03/20/03

03/20/03



## **Analytical Report**

Client: TNU-HANFORD F03-003 H2098

LVL#: 0303L932

W.O.#: 11343-606-001-9999-00

Date Received: 03-13-03

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

- 2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met.
- 4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. The method blanks were within the method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike (MS) recoveries for Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Phosphate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia and Sulfide were within the 75-125% control limits.
- 8. The replicate analyses for Percent Solids, Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide Phosphate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia, pH and Sulfide were within the 20% Relative Percent Difference (RPD) control limit.
- Results for solid samples are reported on a dry weight basis.
- 10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

njp\i03- 932

04-01-03 Date

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

## Lionville Laboratory Incorporated

## WET CHEMISTRY

## METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	D2216-80		•
% Moisture	,D2216-80		ILMO4.0 (e)
% Solids	<b>D2216-80</b>		ILMO4.0 (e)
% Volatile Solids	D2216-80		_
ASTM Extraction in Water	D3987-81/85		
BTU	D240-87		
CEC		9081	_ c
Chromium VI		✓ 3060A/7196A	<del></del>
Corrosivity by coupon by pH		1110(mod) 9045C	
Cyanide, Total		√ 9010B/9014	ILMO4.0 (e)
Cyanide, Reactive		Section 7.3/9014	
Halides, Extractable Organic		9020B	EPA 600/4/84-008
Halides, Total		9020B	EPA 600/4/84-008
EP Toxicity		1310A	
Flash Point		1010	
Ignitability		1010	
Oil & Grease		9071A	•
Carbon, Total Organic		9060	Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	D240-87(mod)	5050	
Petroleum Hydrocarbons, Total Rec	overable	—/ <sup>9071</sup>	EPA 418.1
pH, Soil		√ 9045C	
Sulfide, Reactive		Section 7.3/9030B	
Sulfide		√ 9030B(mod)	
Specific Gravity	D1429-76C/ _	D5057-90	
Sulfur, Total		9056	
Synthetic Preparation Leach		1312	
Paint Filter		9095A	
Other: Cheoride Jenoride Attr	te Method: >	EPA 300.0 (mad.)	
Other: Attate Phosphoto, Au	efate Method 5		
Mitrate Atrite	V E	PA 353.2 (mod.)	
ammonia	EP	A 350.3	

## **Lionville Laboratory Incorporated**

## METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

## **ABBREVIATIONS**

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

## ANALYTICAL WET CHEMISTRY METHODS

- ASTM Standard Methods.
- USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
- a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
- b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
- c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
- d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

#### INORGANICS DATA SUMMARY REPORT 04/04/03

CLIENT: TNUHANPORD F03-003 H2098

LVL LOT #: 0303L932

RBPORTING

DILUTION

WORK ORD	ER:	11343-606-001-9999-00
----------	-----	-----------------------

SAMPLE	SITE ID	ANALYTB	RESULT	UNITS	LIMIT	FACTOR
	******			*****	*******	
-001	B16541	% Solids	96.3	4	0.01	1.0
		Chloride by IC	2.0	MG/KG	1.3	1.0
		Fluoride by IC	1.3 u	MG/KG	1.3	1.0
		Nitrite by IC	1.30 u	MG/KG	1.30	1.0
		Nitrate by IC	1.30 u	MG/KG	1.30	1.0
		Cyanide, Total	0.48 u	MG/KG	0.48	1.0
		Phosphate by IC	1.3 u	MG/KG	1.3	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	3.0	MG/KG	1.3	1.0
		Nitrate Nitrite	0.18 u	MG/KG	0.18	1.0
•		Ammonia, as N	4.4 u	MG/KG	4.4	1.0
		pН	9.2	SOIL PH	0.01	1.0
		Sulfide	28.1 u	MG/KG	28.1	1.0

## INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/04/03

CLIENT: TNUHANFORD F03-003 H2098
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0303L932

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
******			=======		*****	
BLANK10	03LICC17-MB1	Chloride by IC	1.2 u	MG/KG	1.2	1.0
<b></b>		Fluoride by IC	1.2 u	MG/KG	1.2	1.0
		Nitrite by IC	1.25 u	MG/KG	1.25	1.0
		Nitrate by IC	1.25 u	MG/KG	1.25	1.0
		Phosphate by IC	1.2 u	MG/KG	1.2	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK1	03LCA27-MB1	Cyanide, Total	0.50 u	MG/KG	0.50	1.0
BLANK10	03LVI014-MB1	Chromium VI	0. <b>4</b> 0 u	MG/KG	0.40	1.0
BLANK10	03LN3C17-MB1	Nitrate Nitrite	0.20 u	мс/ка	0.20	1.0
BLANK10	03 LAMA10-MB1	Ammonia, as N	5.0 u	MG/KG	5.0	1.0
BLANK10	03LSD010-MB1	Sulfide	40.0 u	MG/KG	40.0	1.0

#### INORGANICS ACCURACY REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0303L932

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	TRUOMA	*RECOV	Factor (SPK)
*****	******		*****		**===	******	
-001	B16541	Chloride by IC	26.6	2.0	26.0	94.7	1.0
		Fluoride by IC	26.9	0.0	26.0	103.6	1.0
		Nitrite by IC	25.6	1.30u	26.0	98.6	1.0
		Nitrate by IC	25.3	1,30u	26.0	97.2	1.0
		Cyanide, Total	4.32	0.48u	4.37	7 99.0	1.0
		Phosphate by IC	27.5	1.3 u	26.0	105.8	1.0
		Soluble Chromium VI	4.2	0.42u	4.2	96.8	1.0
		Insoluble Chromium VI	1410	0.42u	1180	120.1	100
		Sulfate by IC	28.5	3.0	26.0	98.1	1.0
		Nitrate Nitrite	6.8	0.18u	6.9	98.6	1.0
		Ammonia, as N	157	4.4 u	152	103.5	1.0
		Sulfide	212	4.2	225	92.4	1.0
BLANK10	03LICC17-MB1	Chloride by IC	24.2	1.2 u	25.0	96.9	1.0
		Fluoride by IC	24.7	1.2 u	25.0	98.8	1.0
		Nitrite by IC	24.0	1.25u	25.0	95.9	1.0
		Nitrate by IC	23.9	1.25u	25.0	95.7	1.0
		Phosphate by IC	26.3	1.2 u	25.0	105.3	1.0
		Sulfate by IC	24.1	1.2 u	25.0	96.4	1.0
BLANK10	03LVI014-MB1	Soluble Chromium VI	4.0	0.40u	4.0	98.9	1.0
		Insoluble Chromium VI	1260	0.40u	1110	113.5	100
BLANK10	03LN3C17-MB1	Nitrate Nitrite	5.0	0.20u	5.0	101.0	1.0
BLANK10	03LAMA10-MB1	Ammonia, as N	204	5.0 u	200	101.8	1.0
		Ammonia, as N MSD	196	5.0 u	200	98.0	1.0
BLANK10	03LSD010-MB1	Sulfide	371	40.0 u	394	94.2	1.0

### INORGANICS DUPLICATE SPIKE REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098

LVL LOT #: 0303L932

			antyp#1	SPIKE#	
•			SETUR#1	. BFIRD#	•
SAMPLE	SITE ID	ANALYTE	*RECOV	*RECOV	*DIFF
225425#			=====		
BLANK10	03LAMA10-MB1	Ammonia, as N	101.8	98.0	3.8

## INORGANICS PRECISION REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098

LVL LOT #: 0303L932

WORK	ORDER:	11343-606-001-9999-00	0
------	--------	-----------------------	---

*******						
			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	FACTOR (REP)
	************	*************		**=======	*====	*****
-001RBP	B16541	* Solids	96.3	96.1	0.20	1.0
		Chloride by IC	2.0	2.4	15,4	1.0
		Fluoride by IC	1.3 u	1.3 u	NC	1.0
		Nitrite by IC	1.30u	1.30u	NC	1.0
		Nitrate by IC	1.30u	1.30u	NC	1.0
		Cyanide, Total	0.48u	0.42u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	0.42น	0.42u	NC	1.0
		Sulfate by IC	3.0	3.0	1,5	1.0
		Nitrate Nitrite	0.18u	0.22u	NC	1.0
		Ammonia, as N	4.4 u	4.2 u	NC	1.0
		рн	9.2	9.2	0.3	1.0
		Sulfide	28.1 u	25.5 u	NC	1.0

## INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/04/03

CLIENT: TNUHANFORD F03-003 H2098

LVL LOT #: 0303L932

			SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	TRUOMA	UNITS	*RECOV
****		***====================================	*****		****	=====
LCSS1	03 LCA27-LCS1	Cyanide, Total LCS	1.87	2.0	MG/KG	93.6
LCSS2	03 LCA27-LC92	Cyanide, Total LCS	9.84	10.0	MG/KG	98.4

ionville Labor	atory L	lse Only	Cust	ody Trar	sfe	er l	Rec	ord/L	ab \	۷o	rk	Re	qu	est	Pag	e_/	of	<u> </u>	1	31	<b>N</b> /	1.	I
03031	93	2		FIELD PERS	ONNE	EL: C	OMPLE	TE ONL	Y SHAD	ED A		s c		9		E	<b>-</b>	F	G		IONVILLEL	ABORATO	RY INC.
Client	1U-	HANFO	PD SA	F# F03-0	03	•	Refrige	rator #		1	6	6		6		6		6	6				
Est. Final Pro	j. Samp	oling Date					#/Type	Container	Liquid														
Project #	<del></del>	(1342	b- 606-	001- 9999-0	บ				Solid	IAG	IAG	[K-		AL		JAG	-	IAG	IAG				
Project Conta				07			Volume	•	Liquid	252	200	-		_			_		<del> </del>	——			<del> </del>
Lionville Labo	oratory	Project Ma	enager			<del></del>	Preserv	enti-ma	Solid	و ده	250	220		250		25	-	500	60	<del> </del> -	<del> </del>		├
ac SPEC	<del></del>	Del3	TAT	30 day	<u> </u>		Preserv	/BUIVES	ــــــــــــــــــــــــــــــــــــــ		ORG	ANIC		ALK		<del>-   -</del>	NORG	TC	2"	┧	+	_	├
Date Rec'd	3-1	3-03	Date Du	e 4-(Z-	03	·	ANALY	SES	-	7 <u>\</u> 0 0 0		PCB BB		51024 61024		023		14.	P#				
MATRIX			<del></del>		Ma	strix						<u> </u>	1	<u>_</u>	ionville					<del>↓</del>	_l	<u> </u>	<u></u>
CODES: S - Soil SE - Sediment SO - Solid	Lab ID		Client ID/De	scription	Ch-	osen	Matrix	Date Collected	Time Collected	E + 190	0615x	27/0	-	06esc		2.00	2	340KG.()	H) 07				
SL - Sludge W - Water O - Oil A - Air DS - Drum	<b>∞</b> 1	B16	541		i/	MSD		3-11-03	1045	Ī	(	1					K	<b>2</b> (					
Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish																+							ļ
			······································			}										+-		-	-				
Special Instruct	ions:	5A	F # F0	3-003	<u>.L</u>	INO	4G ()	1. As, B 2. (ecc., 3. (NH3	icfl, (C	NO3	icno	2 <u>, 10</u>				<u>N</u> 2,	1) Ship Hand I Airbill # 2) Amb	Liony es were: ped Delivered pient or (	or or illed	Ta 1) P 2)	y Use O imper Res Present ackage Unbrot ackage Present	istant Se t or Or Y or en on Y or	uter N Outer N ample

Relinquished by	Received by	Date	Time
F.DE	W. Wend	3/3/03	0955
1	0		

MET.	O 1. As, Ba,	Cd.Cr.Pl	5e A	Be, Cu. Ni, V, Zn. Hg
inorg	O 2 ICCL, ICF	L, (CN03.	ICNOZ, I	CPO4. 1CSO4, 1N3NZ,
	3. <u>(NH3 N</u>	ICNTO	. ISFD	
	4			
	5			
	6			<del></del>
Relinquished by	Received by	Date	Time	Discrepancies Between Samples Labels and
COMPOS WASI	72	ORIGIN	L_ i	COC Record? Y or NOTES:
	· · · · · · · · · · · · · · · ·	REWRIT	IEN	7902290237

i	4) Samples Property Preserve
	Property Preserve
zies Between	ூ∘
abels and	5) Received With

Discrepancies Between
Samples Labels and
COC Record? Y or NOTES:
7902 2902 374 5) Received Within
Holding Times
or N

4) Unbroken on Sample of N COC Record Present Upon Sample Rec't

Cooler Temp. \_\_\_\_\_\_°C

FH-Central	Plateau Project	CI	HAIN OF CUST	ODY/S	AMPL	E ANALY	/SIS	REQU	JEST		F03	-003-155	Page 1	of 1
Collector Fahlberg/Johansen/	Thomas		iny Contact Cearlock	Telepho 373-3				Project TRENT,	Coordina SJ	ltor Pi	rice Code	8N	Data Tu	
Project Designation 200 Area Source Ch	naracterization 200-CS-1 OU - Soil		ing Location chole B8828 (100-102 ft)	)				SAF No. F03-003		Ai	ir Quality		45 1	Days
Ice Chest No.	25 01-025		Logbook No. F-N-3251			ms 3-6-03 <del>310</del> -118322		Method Federa	of Shipm d Express			<u></u>		
Shinned To	ICES (Formerly TMA) BECL	Offsite	Property No.	30 14	64		·	Bill of I	ading/Ai	ir Bill No.	790	<u>ح</u> 2	202	3746
POSSIBLE SAMPL	E HAZARDS/REMARKS						0.1			31			/	
Redi			Preservation	Cool 4C	Cool 4C	Cool 4C	Cool	40	None	None	None	None	None	
T: ~ Te	and/or Storage		Type of Container	aG	аG	aG	aC	•	aG	aG	aG	аG	29	
	00/40		No. of Container(s)	1	1	1	1		1	1	ექე	1	18,	_
			Volume	250mL	250mL	250mL	250	mL 5	00mL	500mL	125ml Leonal	1000mL	) 125mL	
	SAMPLE ANAL	YSIS		VOA - 8260A (TCL)	See item (1) Special Instructions	Glycols, &	PCBs -	S	pecial	ee item (3) in Special Instructions.	рН (Soil) - 9045	See item (Fin Special Instructions	Nickel-63; Technetium- 99; Tritium - H3	
Sample No.	Matrix *	Sample Date	Sample Time											
B16541	SOIL	3-11-03	1045	X	X	X	X	' >	<	×	X	<u>/</u>		
										<u></u> -	<u> </u>		<u>-</u>	
					-						ļ.——			
		`			<del> </del>	+					1	<del> </del>		
CHAIN OF PO	SCESSION	Sign/Prin	t Names	l	SPI	ECIAL INSTR	исти	ONS		<del> </del>	<u> </u>	L		Matrix *
Relinquished By/Removed  Relinquished By/Removed  3 3 3 7 2 K  Relinquished By/Removed  Relinquished By/Removed  Relinquished By/Removed  Relinquished By/Removed	d From Frt Date/Time    Date/Time   2   3   1   6     From Date/Time   2   3   1   6     From Date/Time   3   1   6     From Date/Time   6     From El Date/Time   6     From Date/Time   7     From Date/Time	Received By/Stor Received By/Stor Received By/Stor Received By/Stor	red In FR Di RT hylbry 3728 3.  red In Di RT hylbry  A J J J J J J J J J J J J J J J J J J	ate/Time    11/03     11/03     12/04     12/05     13/05     14/0	1230 Dz An: (1) (2) (2) (3) (4) (4) (5)	beclaL INSTR breports Decane a analysis. FH acknown alyze pH within 2. Semi-VOA - 82 ICP Metals - 6010 P Metals - 6010 P Metals - 6010 IC Anions - 300,3; Tr Gress Alpha, Gr 4, Europium-155 Ropic Thorium [Tr 30 - Total SF, To	as a TiC owledge 4 hr of r 70A (Ad 10A (Supertrium Hex 0 (Chlootal Cya 05S Beta ; Gamm horium	if detectables that the hoseceipt.  dd-On) {Trilpertrace} {Arace Add-Ori-7196 ride, Fluorice, Fluorice, Guardana Spec Add-232}; Isotop	butyl phosp rsenic, Bar i) (Berylliu de, Nitrate, Sulfides - pectroscopy	ohate}; TPH- ium, Cadmi im, Copper, Nitrite, Pho 9030 7 (Casium-1	Diesel Range um, Chromium Nickel, Vanad sphate, Sulfate	r 9056 will not  - WTPH-D , Lead, Sclenium, Zinc); Me  }; NO2/NO3 - , Europiam 132 Isotopic Pluton iam-237; Stront	m, Silver}; reury - 353.2; ; Europium- aum; ium-	S-Soil  SE-Sediment  SO-Solid  SI-Shulge  W = Water  O-Oil  A-Air  DS-Druen Liquids  T-Tissue  WI-Wipe  T-Tipli  SOING  S
FINAL SAMPLE DISPOSITION	Disposal Method					Dispo	sed By					I	Date/Time	

## LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFORD

Purchase Order/Project:

DATE: 3-13-03

SAF#/ SOW# / Release #: F03 -043

Laboratory SDG #: 03031932

<u> </u>	ALL ENTRIES MARKED "NO" MUST BE E	/			i
1.	Custody seals on coolers or shipping container intact, signed and dated?	Q.Yes	□ N <sub>0</sub>	□ N/A	□ see Comment
2.	Outside of coolers or shipping containers are free from damage?	□ Yes	□ No	□ N/A	see Comment
3.	Airbill # recorded?	₽ Yes /	□ No	□ N/A	see Comment
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	E Yes	□ N <sub>0</sub>	□ N/A	See Comment
5.	Sample containers are intact?	terres	□ No	□ N/A	□ see Comment
6.	Custody seals on sample containers intact, signed and dated?	D Yes	□ No	□ N/A	D see Commen
7.	All samples on coc received?	De Yes	□ No	□ N/A	see Commen
8.	All sample label information matches coc?	Vies	□ No	□ N/A·	see Commen
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	Ú Yes	□ No	□ N/A	🗀 see Commen
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	D Yes	□ No	□ N/A	🗆 see Commer
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	IB-HVA	🗆 see Comme
12.	coc signed and dated?	E Yes	□ No	□ N/A	□ see Comme
13.	coc will be faxed or emailed to client?	TYes.	D No	D N/A	🗆 see Comme
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	r □ Yes	□ No	□ N/A	□ see Comme

Cooler # / temp (°C) and Comments:

:RC-01-025 1-3°

Laboratory Sample Custodian:

Laboratory Project Manager:

it Vemb